

# **ESSENTIAL DATA DUPLICATOR**

**4**

**SOURCE CODE LISTING**

**UTILICO MICROWARE**

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## INTRODUCTION

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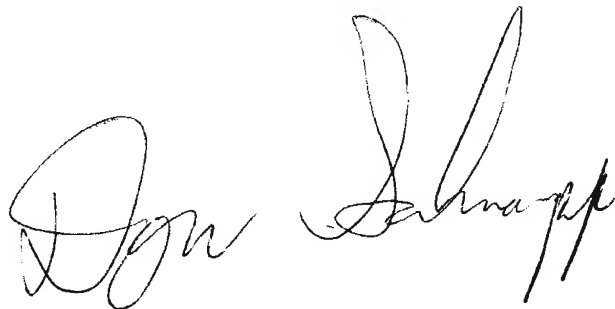
Written by Donald Anthony Schnapp using an apple IIe computer, Essential Data Duplicator 4 is a powerful computer program for allowing the user to make back up copies of his "copy-protected" software. The 6502 assembler which was used to enter EDD 4 is named "BIG MAC", which is similar to the "MERLIN" assembler written by Glen Bredon (available from Roger Wagner Publishing Inc.).

The main purpose of us providing this listing, is to let you see the "insides" of a sophisticated 6502 computer program for educational purposes. Buried in this listing are subroutines for managing routines, text output routines, hi-resolution graphic output routines, multiply and divide routines, interfacing disk drives routines, plus many more. Perhaps our routines will give you ideas for creating your own.

The section on the PLUS card explains how it works and how to interface it with your own 6502 programs.

Since every "batch" of EDD disks are programmed differently, this listing may not be an exact listing of an EDD disk which you may own. For reference purposes, this source code listing was printed out from the batch of EDD 4 disks recorded on April 23, 1986.

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A handwritten signature in cursive script, reading "Don Schnapp". The signature is written in dark ink and is positioned in the lower right area of the page.



PLUS CARD TECHNICAL INFORMATION  
AND SOFTWARE INTERFACING

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The purpose of the PLUS card is to read the bits of data coming from the disk drive and to make them available to computer software. This is done by first taking eight bits of data from the raw bit stream coming from the disk drive, combining them to form a raw disk byte, at which time a flag is set. Software detects the flag, reads the raw disk byte, at which time the flag is cleared. And the whole process is repeated until all the information is gathered. Using this process, every bit of data coming from the raw bit stream can be accurately read into the computer's memory.

The PLUS card has two valid memory locations in which software can access. They are \$C080,X and \$C081,X where "X" equals the slot number times \$10. For example, if the PLUS card has been installed in slot #5, "X" would need to equal "\$50" or if slot #7 was used, "X" would need to equal "\$70".

A description of EDD PLUS card memory locations are as follows:

\$C080,X contains the 8 bit raw disk byte.  
(only valid if READY FLAG is minus)

\$C081,X contains the READY FLAG.

Here is a sample routine, which takes one byte from the disk drive (note: drive must already be ON, in the read mode, and the read/write head must be located on the track which needs to be read):

```
.
.
CHKREADY  LDX  #$50          ;Slot number of PLUS card.
          LDA  $C081,X       ;See if READY FLAG is set.
          BPL  CHKREADY      ;No, go back & check again.
          LDA  $C080,X       ;Yes, take the byte.
.
.
```

To go one step further, here is a routine which takes \$2000 bytes from the disk drive and stores them in memory locations from \$6000 through \$7FFF (note: disk drive must already be set up as before):

```
.
.
          LDY  #$60          ;Set up memory
          STY  $1            ;pointers to start
          LDY  #$0           ;storing at address $6000.
          STY  $0            ;
          LDX  #$50          ;Slot number of PLUS card.
CHKREADY  LDA  $C081,X       ;See if READY FLAG is set.
          BPL  CHKREADY      ;No, go back & check again.
          LDA  $C080,X       ;Yes, take the byte.
          STA  ($0),Y         ;Store the byte in memory.
.
```

```

      INY                ;Move pointer to point
      BNE  CHKREADY      ;at next memory byte.
      INC  $1            ;If not at mem $8000 yet,
      BPL  CHKREADY      ;go back and do again.
      .
      .

```

The first example below, is what a raw bit stream looks like when a "normal" timing gap containing \$FF disk bytes with 2 timing bits attached is read by the disk drive. Below this, is what the disk bytes look like after they pass through a "standard" apple drive controller which "strips off" all the timing bits. Lastly, is what the raw disk bytes look like after they pass through the PLUS card (from the raw bit stream), which keeps all bits intact:

```

      Raw bit stream coming from disk drive:
1111111100111111110011111111001111111100111111110011111111

```

```

      Raw disk bytes read using the apple drive controller:
      FF      FF      FF      FF      FF      FF
11111111 11111111 11111111 11111111 11111111 11111111

```

```

      Raw disk bytes read using the PLUS card:
      FF      3F      CF      F3      FC      FF
11111111 00111111 11001111 11110011 11111100 11111111

```

Since raw disk bytes read using the PLUS card are not usually very useful in their "raw" format, you will often need to create a routine which separates the data bytes from the timing bits. The routine which EDD uses to read the disk and separate the timing bits is called "DCCDUMP", and is contained in the "DRIVE ROUTINES" listing.

Although it is usually not very useful, it is, of course, possible to read in a whole buffer full of raw disk bytes, and then write them out without ever decoding or analyzing them.

#### ADDITIONAL PLUS CARD PROGRAMMING INFORMATION:

When writing programs for use with the PLUS card, keep in mind that one raw disk byte will be ready approximately every 32 cycles (one bit in 4 cycles equals 8 bits in 32 cycles). If your routine doesn't read the raw disk byte shortly after the READY flag is set, you will miss it. KEEP YOUR LOOPS SHORT!

The book named "Beneath Apple DOS" has all of the detailed information needed for accessing the disk drive through the drive controller.

\*\*      \*\*      \*\*

# ESSENTIAL DATA DUPLICATOR 4 MEMORY ALLOCATION \_\_\_\_\_

\$0000 - \$00FF = ZERO PAGE VARIABLES  
\$0100 - \$01FF = STACK POINTER  
\$0200 - \$03FF = MISC. POINTERS/VALUES  
\$0400 - \$07FF = EDD LOADER  
\$0800 - \$0BFF = TEXT DISPLAY SCREEN  
\$0C00 - \$17C2 = MAIN EDD ROUTINES  
\$17C3 - \$1CFF = CHANGE PARAMETERS & BACK UP A DISK MODULE  
\$1D00 - \$20FF = SCAN DISK & CERTIFY A DISK OPTIONS MODULE  
\$2100 - \$25FF = DRIVE SPEED & DRIVE EXAMINE OPTIONS MODULE  
\$2600 - \$2C29 = ANALYZE A DISK MODULE  
\$2C2A - \$2FFF = CONTROL MODULE  
\$3000 - \$3FFF = TEXT TABLES & ADDRESSES  
\$4000 - \$77FF = RAW DISK BYTE BUFFER  
\$7800 - \$AFFF = TIMING BIT BUFFER  
\$B000 - \$B0FF = PREANALYZE ROUTINE BUFFER  
\$B100 - \$B1FF = PREWRITE ROUTINE BUFFER  
\$B200 - \$B2FF = PROGRAM VARIABLE STORAGE BUFFER  
\$B300 - \$B3FF = PARAMETER BUFFER  
\$B400 - \$B4FF = PARAMETER BUFFER (reserved)  
\$B500 - \$B6FF = EXPANSION SPACE  
\$B700 - \$BFFF = DISK DRIVE ROUTINES MODULE

\*\*\*





```

1 *****
2 * ESSENTIAL DATA DUPLICATOR
3 * VERSION 4.2 STANDARD/PLUS
4 * 6502 ASSEMBLY SOURCE CODE
5 * COPYRIGHT (C) 1986
6 * ALL RIGHTS RESERVED
7 * UTILICO MICROWARE
8 * DONALD ANTHONY SCHNAPP
9 * PRINTED APRIL 23, 1986
10 *****
11
12 *****
13 * MAIN ROUTINE MODUAL *
14 *****
15
16 -----*
17 * MEMORY ALLOCATIONS *
18 -----*
19 ZPAGE      =      $0000      ;-$00FF
20 EDD4       =      $0C00      ;-$1BFF
21 CERTDISK   =      $1000
22 SCANDISK   =      $1003
23 CHECKMEM   =      $1F0C
24 DRVEXAM    =      $2100
25 DRVSPEED   =      $2103
26 ANALYZE    =      $2600
27 CONTROL    =      $2C2A
28 TXTABLE    =      $3000      ;-$3FFF
29 PREANLZ    =      $B000      ;-$B0FF
30 CONTRLP    =      $B100      ;-$B1FF
31 VAR        =      $B200      ;-$B2FF
32 PARMS      =      $B300      ;-$B3FF
33 PARMSET    =      $B400      ;-$B4FF
34 DRV        =      $B700      ;-$BFFF
35
36 -----*
37 * ZERO PAGE USAGE *
38 -----*
39 W1L        =      ZPAGE+$0
40 W1H        =      ZPAGE+$1
41 W2L        =      ZPAGE+$2
42 W2H        =      ZPAGE+$3
43 W3L        =      ZPAGE+$4
44 W3H        =      ZPAGE+$5
45 W4L        =      ZPAGE+$6
46 W4H        =      ZPAGE+$7
47 W5L        =      ZPAGE+$8
48 W5H        =      ZPAGE+$9
49 SCVP       =      ZPAGE+$A
50 SCHP       =      ZPAGE+$B
51 SAL        =      ZPAGE+$C
52 SAH        =      ZPAGE+$D
53 WZPAGE1    =      ZPAGE+$E
54 WZPAGE2    =      ZPAGE+$F
55 CSLT       =      ZPAGE+$10
56 CDRV       =      ZPAGE+$11
57 CTRK       =      ZPAGE+$12
58 CWRK       =      ZPAGE+$13
59 DCF        =      ZPAGE+$14
60 HXF        =      ZPAGE+$15
61 HXL        =      ZPAGE+$16
62 HXH        =      ZPAGE+$17
63 HDCF       =      ZPAGE+$18
64 HHXL       =      ZPAGE+$19
65 HHXH       =      ZPAGE+$1A
66 LDCF       =      ZPAGE+$1B
67 LHXL       =      ZPAGE+$1C
68 LHXH       =      ZPAGE+$1D
69 VMODE      =      ZPAGE+$20
70
71 -----*
72 * VARIABLES *
73 -----*
74 LTS        =      VAR+$00
75 LTC        =      VAR+$30
76 LTP        =      VAR+$3E
77 LTEX       =      VAR+$48
78 LTEXA      =      VAR+$55
79 LTDV       =      VAR+$61
80 LTQ        =      VAR+$65
81 LTEM       =      VAR+$69
82 RA         =      VAR+$6E
83 RY         =      VAR+$6F
84 RX         =      VAR+$70
85 RP         =      VAR+$71

```

```

00000000 LVP == VAR+$72
00000001 LASTHP == VAR+$73
00000002 KYVALUE == VAR+$74
00000003 TWINDTOP == VAR+$75
00000004 SCNMIBR == VAR+$76
00000005 SCPT == VAR+$77
00000006 SCPCB == VAR+$78
00000007 SCWP == VAR+$79
00000008 SCHKYVLU == VAR+$7A
00000009 SCORCT == VAR+$7B
00000010 SCFLTP == VAR+$7C
00000011 SCULPNT == VAR+$7D
00000012 PTRANGE == VAR+$7E
00000013 SPDLPNTR == VAR+$7F
00000014 POS == VAR+$80
00000015 PDD == VAR+$81
00000016 PDS == VAR+$82
00000017 PDD == VAR+$83
00000018 DCCSLOT == VAR+$84
00000019 DRVCOUNT == VAR+$85
00000020 CTRKO == VAR+$86
00000021 CTRKO == VAR+$87
00000022 STARTRK == VAR+$88
00000023 ENDTRK == VAR+$89
00000024 STEP == VAR+$8A
00000025 TRACK == VAR+$8B
00000026 SYNCFLG == VAR+$8C
00000027 NBLCCFLG == VAR+$8D
00000028 TIMEFLG == VAR+$8E
00000029 DRVLETTTR == VAR+$8F
00000030 TLENL == VAR+$90
00000031 TLENH == VAR+$91
00000032 WRKPNTR == VAR+$92
00000033 WS == VAR+$93
00000034 WSL == VAR+$94
00000035 WSH == VAR+$95
00000036 FLG == VAR+$96
00000037 WRKPNTR2 == VAR+$97
00000038 WS2 == VAR+$98
00000039 WSL2 == VAR+$99
00000040 WSH2 == VAR+$9A
00000041 EPU == VAR+$9B
00000042 EPH == VAR+$9C
00000043 EPTSV == VAR+$9D
00000044 EPTSH == VAR+$9E
00000045 CNVHEX == VAR+$9F
00000046 CNVDEC == VAR+$A1
00000047 TEMPT == VAR+$A6
00000048 TEMPL == VAR+$A7
00000049 TEMPH == VAR+$A8
00000050 TTLENL == VAR+$A9
00000051 TTLENH == VAR+$AA
00000052 DIFL == VAR+$BB
00000053 DIFH == VAR+$BC
00000054 ARMAITR == VAR+$BD
00000055 ARMCUL == VAR+$BE
00000056 ARMCVH == VAR+$BF
00000057 WRKSPCC == VAR+$C0
00000058 TRKDSL == VAR+$C1
00000059 TRKDSH == VAR+$C2
00000060 TRKTSH == VAR+$C3
00000061 TRKDEL == VAR+$C4
00000062 TRKDEH == VAR+$C5
00000063 TRKTEH == VAR+$C6
00000064 TRKLL == VAR+$C7
00000065 TRKLLH == VAR+$C8
00000066 ERRORCD == VAR+$C9
00000067 EDDVRSN == VAR+$CA

00000068 *-----*
00000069 * PARAMETERS *
00000070 *-----*
00000071 SYNCTBLE == PARM+$00
00000072 TIMEBITS == PARM+$09
00000073 SPCLCNTL == PARM+$0A
00000074 ABSLNGTL == PARM+$0C
00000075 ABSLNGTH == PARM+$0D
00000076 MINLNGTH == PARM+$10
00000077 MAXLNGTH == PARM+$11
00000078 PLNGCNTL == PARM+$12
00000079 PENDCNTL == PARM+$13
00000080 PTGAPMIN == PARM+$17
00000081 RERRORS == PARM+$19
00000082 WERRORS == PARM+$1A
00000083 TRKSYNC == PARM+$1B
00000084 MNBTEQLN == PARM+$1C

```

```

172
173 *-----*
174 * EDD4 COMMON ROUTINE HOOKS *
175 *-----*
176 *W1 = EDD4+$3
177 *W2 = EDD4+$2
178 *W3 = EDD4+$9
179 *EPCALC = EDD4+$C
180 *EPCALC1 = EDD4+$F
181 *EPCALC2 = EDD4+$12
182 *CHKESC = EDD4+$15
183
184 *-----*
185 * COMMON ANALYZE ROUTINE HOOKS *
186 *-----*
187 ANALYZET = ANALYZE+$0
188 FNDLNTH = ANALYZE+$3
189 WSTSYNC = ANALYZE+$6
190 NCAUTO = ANALYZE+$9
191
192 *-----*
193 * COMMON DRIVE ROUTINE HOOKS *
194 *-----*
195 TDUMPW = DRVR+$00
196 TDUMPP = DRVR+$03
197 ARMV = DRVR+$06
198 ARMV2 = DRVR+$09
199 SYNCTRK2 = DRVR+$0C
200 TRKV1 = DRVR+$0F
201 TRKV2 = DRVR+$12
202 TRKV3 = DRVR+$15
203 ARMSPD = DRVR+$18
204 WRITETRK = DRVR+$1B
205 DCCDUMP = DRVR+$1E
206 TDUMPU = DRVR+$21
207 TRKDS = DRVR+$24
208 PCRDCHK = DRVR+$27
209
210 *-----*
211 * EDD 4 MANAGER *
212 *-----*
213
214 ORG EDD4 ;$0C00
215
216 JMP EDD
217 JMP W1 ;$0C03
218 JMP W2 ;$0C06
219 JMP W3 ;$0C09
220 JMP EPCALC ;$0C0C
221 JMP EPCALC1 ;$0C0F
222 JMP EPCALC2 ;$0C12
223 JMP CHKESC ;$0C15
224
225 EDD LDY #0 ;INIT
226 STY SCVP ;EDD
227 STY SCHP
228 STY TWINDTOP
229 STY VMODE
230 E LDA PARMS,Y ;RESET
231 STA PARMSSET,Y ;PARMS
232 INY ;TO
233 BNE E ;DEFLT
234 LDA $C051 ;SET
235 LDA $C055 ;SCREEN
236 LDA POS
237 ASLA ;SET
238 ASLA ;CURRENT
239 ASLA ;DRIVE
240 ASLA ;SLOT
241 STA CSLT
242 LDA #$FF ;UNSET
243 STA CTRKD ;CURNT
244 STA CTRKD ;TRACKS
245 LDA #0 ;DISPLY
246 JSR TOUT ;TITLE
247 JSR BL ;SCREEN
248 E0 LDA $C000
249 BPL E0
250 BIT $C010
251 E1 LDA #1 ;DISPLY
252 JSR TOUT ;E/PCODE
253 LDA #33 ;MENU
254 JSR TOUT
255 LDA #34
256 JSR TOUT
257 DE JSR MTROFF ;DOESC

```

00C65:	20	0C	1F	258		JSR	CHECKMEM	
00C66:	20	51	C0	259		BIT	#C051	
00C68:	20	C0	13	260	E2	JSR	SCDDSPY	
00C6E:	A9	08		261		LDA	#8	:SET
00C70:	80	75	B2	262		STA	TWINDTOP	:WINDOW
00C73:	A9	03		263		LDA	#3	:DISPLY
00C75:	20	05	15	264		JSR	TOUT	:AND GET
00C78:	20	4F	0F	265		JSR	SCGETO	:OPTION
00C7B:	BE	B6	16	266		LDX	LTEDDO,Y	
00C7E:	B9	B7	16	267		LDA	LTEDDO+1,Y	
00C81:	86	00		268	E3	STX	WIL	:GET
00C83:	85	01		269		STA	WIL	:READY
00C85:	20	0F	14	270		JSR	EPCLEAN	:TO DO
00C88:	A0	01		271		LDY	#1	:OPTION
00C8A:	AD	80	B2	272		LDA	PDS	
00C8D:	CD	82	B2	273		CMP	PDS	
00C90:	D0	09		274		BNE	ES	
00C92:	AD	81	B2	275		LDA	PDS	
00C95:	CD	83	B2	276		CMP	PDS	
00C98:	00	01		277		BNE	ES	:0=ONE
00C9A:	88			278		DEY		:1=TWO
00C9B:	8C	85	B2	279	ES	STY	DRVCOUNT	:DRIVE
00C9E:	20	A4	0C	280		JSR	FEJ	:SYSTEM
00CA1:	4C	68	0C	281		JMP	E2	
00CA4:	6C	00	00	282	EJ	JMP	(WIL)	:DO OPTN
00CA7:	A9	00		283		CLRERRCD	LDA #0	:CLEAR
00CA9:	8D	75	B2	284		STA	TWINDTOP	:ERROR
00CAC:	4C	53	0C	285		JMP	E1	:CODES
00CAF:	A9	08		286		CHNGSLTS	LDA #8	:CHANGE
00CB1:	20	05	15	287		JSR	TOUT	:SLOTS &
00CB4:	A9	FF		288		LDA	#FF	:DRIVES
00CB6:	8D	86	B2	289		STA	CTRKO	
00CB9:	8D	87	B2	290		STA	CTRKO	
00CBC:	A9	80		291		LDA	#<POS	
00CC0:	A0	3E		292		LDX	#<LTEM	
00CC2:	20	86	0F	293		LDY	#<LTP	
00CC5:	A9	82		294		JSR	SCVLSL	
00CC7:	A2	B2		295		LDA	#>POS	
00CC9:	A0	B2		296		LDX	#>LTEM	
00CCB:	20	8D	0F	297		LDY	#>LTP	
00CCE:	4C	68	0C	298		JSR	SCVLSHGT	
00CD1:	A9	07		299		JMP	E2	
00CD3:	20	05	15	300	EDDQUIT	LDA	#7	:QUIT
00CD6:	20	4F	0F	301		JSR	TOUT	:OPTION
00CD9:	BE	C8	16	302		JSR	SCGETO	
00CDC:	B9	C9	16	303		LDX	LTQT,Y	
00CDF:	4C	81	0C	304		LDA	LTQT+1,Y	
00CE2:	AD	83	B2	305		JMP	E3	
00CE5:	C9	01		306		LDA	PDS	:WHEN
00CE7:	F0	15		307		CMP	#1	:QUITTING
00CE9:	AD	81	B2	308		BEQ	QD	:BOOT
00CEC:	C9	01		309		LDA	PDS	:FRM THE
00CEE:	F0	08		310		CMP	#1	:DISK IN
00CF0:	AD	82	B2	311		BEQ	QD	:DRV #1
00CF3:	CD	80	B2	312		LDA	PDS	:OR BOOT
00CF6:	B0	06		313		CMP	PDS	:FRM THE
00CF9:	AD	80	B2	314	QD	BCS	QD	:HIGHEST
00CFC:	4C	01	0D	315		LDA	PDS	:SLOT
00D01:	09	C0		316	QD	JMP	QS	
00D03:	85	01		317	QS	LDA	PDS	
00D05:	A9	00		318		ORA	#C0	
00D07:	85	00		319		STA	#1	
00D09:	6C	00	00	320		LDA	#0	
				321		STA	#0	
				322		JMP	(<\$0)	
				323				
				324				
				325				
				326				
				327				
				328				
				329				
				330				
				331				
				332				
				333				
				334				
00D0C:	20	1E	11	335	KYPRMPT	JSR	LNFLASH	:STANDRD
00D0F:	20	28	0D	336		JSR	KYGET	:KEY
00D12:	20	35	0D	337		JSR	KYSUB	:PROMPT
00D15:	8D	74	B2	338		STA	KYVALUE	:ROUTINE
00D18:	20	3C	11	339		JSR	LNINORM	
00D1B:	20	0C	1F	340		JSR	CHECKMEM	
00D1E:	AD	74	B2	341		LDA	KYVALUE	
00D21:	60			342		RTS		
00D22:	20	92	0D	343	KYCLRGET	JSR	K7	

0025: 2C 10 C0 344	BIT	%C010	;	CLEAR,
0026: 20 00 15 345	JSR	RPH	;	GET A
0027: 40 00 00 346	JSR	KYIN	;	KEY
0028: 20 00 15 347	JSR	RPL		
0029: AD 74 B2 348	LDA	KYVALUE		
0030: 60 349	RTS			
0031: 7C 9 A0 350	CMP	##A0	;	REPLACE
0032: 7C 9 0F 351	BEQ	K2	;	MOVEMNT
0033: 7C 9 0A 352	CMP	##8A	;	KEYS
0034: 7C 9 00 353	BEQ	K2	;	WITH
0035: 7C 9 00 354	CMP	##95	;	STANDRD
0036: 7C 9 00 355	BEQ	K2	;	VALUES
0037: 7C 9 00 356	CMP	##8B		
0038: 7C 9 00 357	BNE	K3		
0039: 7C 9 00 358	LDA	##88		
0040: 7C 9 80 359	RTS			
0041: 7C 9 80 360	LDA	##8D		
0042: 7C 9 80 361	RTS			
0043: 7C 9 80 362				
0044: 7C 9 80 363				
0045: AD 00 C0 364	LDA	%C000	;	GET A
0046: 10 00 00 365	BPL	KYIN	;	KEY
0047: 7C 9 00 366	CMP	##E0		
0048: 7C 9 00 367	BCC	KL3		
0049: 7C 9 00 368	AND	##DF	;	FIXCASE
0050: 7C 9 00 369	STA	KYVALUE		
0051: 7C 9 00 370	LDY	##4		
0052: 7C 9 00 371	LDX	##40	;	JUST
0053: 7C 9 00 372	LDA	%C0EC	;	CLICK
0054: 7C 9 00 373	DEX		;	BELL
0055: 7C 9 00 374	BNE	KL2	;	BRIEFLY
0056: 7C 9 00 375	BIT	%C030		
0057: 7C 9 00 376	DEY			
0058: 7C 9 00 377	BNE	KL1		
0059: 7C 9 00 378	BIT	%C010	;	CHECK
0060: 7C 9 00 379	LDA	KYVALUE	;	FOR
0061: 7C 9 00 380	CMP	##9B	;	ESC KEY
0062: 7C 9 00 381	BEQ	K4	;	AND
0063: 7C 9 00 382	CMP	##84	;	CTRL-D
0064: 7C 9 00 383	BEQ	K6	;	KEY
0065: 7C 9 00 384	RTS			
0066: 7C 9 00 385				
0067: 7C 9 00 386				
0068: 7C 9 00 387				
0069: 7C 9 00 388				
0070: 7C 9 00 389				
0071: 7C 9 00 390				
0072: 7C 9 00 391				
0073: 7C 9 00 392				
0074: 7C 9 00 393				
0075: 7C 9 00 394				
0076: 7C 9 00 395				
0077: 7C 9 00 396				
0078: AD 00 C0 397	LDA	%C000	;	ANOTHER
0079: 10 00 14 398	BPL	K3	;	KYPRESS
0080: 7C 9 00 399	CMP	##E0	;	ROUTINE
0081: 7C 9 00 400	BCC	KL4		
0082: 7C 9 00 401	AND	##DF	;	FIXCASE
0083: 7C 9 00 402	BIT	%C010		
0084: 7C 9 00 403	PHA			
0085: 7C 9 00 404	JSR	MTROFF		
0086: 7C 9 00 405	PLA			
0087: 7C 9 00 406	CMP	##9B	;	ESC
0088: 7C 9 00 407	BEQ	K4		
0089: 7C 9 00 408	PLA			
0090: 7C 9 00 409	PLA			
0091: 7C 9 00 410	RTS			
0092: AC 00 C0 411	LDY	%C000	;	CHECK
0093: C0 9B 00 412	CPY	##9B	;	KYBOARD
0094: 00 00 00 413	BNE	K3	;	FOR ESC
0095: AD 10 C0 414	LDA	%C010		
0096: 4C 62 0C 415	JMP	DE		
0097: 7C 9 00 416				
0098: 7C 9 00 417				
0099: 7C 9 00 418				
0100: 7C 9 00 419				
0101: 7C 9 00 420				
0102: 7C 9 00 421				
0103: 7C 9 00 422				
0104: 7C 9 00 423				
0105: 7C 9 00 424				
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0200: 7C 9 00 519				
0201: 7C 9 00 520				
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0238: 7C 9 00 557				
0239: 7C 9 00 558				
0240: 7C 9 00 559				
0241: 7C 9 00 560				
0242: 7C 9 00 561				
0243: 7C 9 00 562				
0244: 7C 9 00 563				
0245: 7C 9 00 564				
0246: 7C 9 00 565				
0247: 7C 9 00 566				
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0249: 7C 9 00 568				
0250: 7C 9 00 569				
0251: 7C 9 00 570				
0252: 7C 9 00 571				
0253: 7C 9 00 572				
0254: 7C 9 00 573				
0255: 7C 9 00 574				
0256: 7C 9 00 575				
0257: 7C 9 00 576				
0258: 7C 9 00 577				
0259: 7C 9 00 578				
0260: 7C 9 00 579				
0261: 7C 9 00 580				
0262: 7C 9 00 581				
0263: 7C 9 00 582				

0DD8:	A9	00	430		LDA	#0	;	A
0DDA:	85	00	431		STA	#0	;	SIMPLE
0DDC:	AD	30	432	B1	LDA	\$C030	;	BELL
0DDF:	20	0D	433		JSR	W4		
0DE2:	C6	00	434		DEC	#0		
0DE4:	D0	F6	435		BNE	B1		
0DE6:	20	DD	436		JSR	RPL		
0DE9:	60		437		RTS			
0DEA:	AD	BD	438					
0DED:	F0	09	439	W1	LDA	ARMWAITR	;	WAIT
0DEF:	AE	BF	440		BEQ	W1S	;	ROUTINE
0DF2:	AC	BE	441		LDX	ARMCVH	;	BETWEEN
0DF5:	4C	1B	442		LDY	ARMCVL	;	ARM
0DF8:	A2	00	443		JMP	WTIN	;	PHASE
0DFA:	A0	DC	444	W1S	LDX	#00		
0DFC:	4C	1B	445		LDY	#0C	;	NORMAL
0DFE:	A2	04	446		JMP	WTIN		
0E01:	A0	00	447	W2	LDX	#04	;	AFTER
0E03:	4C	1B	448		LDY	#00	;	ARMMOVE
0E06:	A2	20	449		JMP	WTIN		
0E08:	A0	00	450	W3	LDX	#20	;	MOTOR
0E0A:	4C	1B	451		LDY	#00	;	ON
0E0D:	A2	00	452		JMP	WTIN		
0E0F:	A0	0B	453	W4	LDX	#00	;	BELL
0E11:	4C	1B	454		LDY	#0B	;	TO
0E14:	A2	03	455		JMP	WTIN		
0E16:	A0	00	456	W5	LDX	#03	;	SCREEN
0E18:	4C	1B	457		LDY	#00	;	PROMPT
			458		JMP	WTIN		
0E1B:	A9	02	459	WTIN	LDA	#2	;	ACTUAL
0E1D:	8D	EC	460		STA	WRKSPC	;	WAIT
0E20:	AD	EC	461	WL	LDA	\$C0EC	;	ROUTINE
0E23:	CE	C0	462		DEC	WRKSPC		
0E26:	D0	F8	463		BNE	WL		
0E28:	88		464		DEY			
0E29:	C0	FF	465		CPY	#FF		
0E2B:	D0	EE	466		BNE	WTIN		
0E2D:	CA		467		DEX			
0E2E:	E0	FF	468		CPX	#FF		
0E30:	D0	E9	469		BNE	WTIN		
0E32:	60		470		RTS			
			471					
0E33:	A9	00	472	CNVDH	LDA	#0	;	CONVERT
0E35:	8D	9F	473		STA	CNVHEX	;	DECIMAL
0E38:	8D	A0	474		STA	CNVHEX+1	;	INPUT
0E3B:	8D	92	475		STA	WRKPNTR	;	CHARS
0E3E:	AC	92	476	CNL1	LDY	WRKPNTR	;	TO
0E41:	C0	05	477		CPY	#5	;	NUMBER
0E43:	F0	35	478		BEQ	CND1		
0E45:	B9	A1	479		LDA	CNVDEC,Y		
0E48:	29	0F	480		AND	#0F		
0E4A:	0E	9F	481		ASL	CNVHEX		
0E4D:	2E	A0	482		ROL	CNVHEX+1		
0E50:	6D	9F	483		ADC	CNVHEX		
0E53:	AA		484		TAX			
0E54:	A9	00	485		LDA	#0		
0E56:	6D	A0	486		ADC	CNVHEX+1		
0E59:	A8		487		TAY			
0E5A:	0E	9F	488		ASL	CNVHEX		
0E5D:	2E	A0	489		ROL	CNVHEX+1		
0E60:	0E	9F	490		ASL	CNVHEX		
0E63:	2E	A0	491		ROL	CNVHEX+1		
0E66:	8A		492		TXA			
0E67:	6D	9F	493		ADC	CNVHEX		
0E6A:	8D	9F	494		STA	CNVHEX		
0E6D:	98		495		TYA			
0E6E:	6D	A0	496		ADC	CNVHEX+1		
0E71:	8D	A0	497		STA	CNVHEX+1		
0E74:	EE	92	498		INC	WRKPNTR		
0E77:	4C	3E	499		JMP	CNL1		
0E7A:	18		500	CND1	CLC			
0E7B:	60		501		RTS			
			502					
0E7C:	A2	00	503	CNVHAD	LDX	#0		
0E7E:	8E	A0	504	CNVHXAD	STX	CNVHEX+1		
0E81:	8D	9F	505		STA	CNVHEX		
0E84:	A9	05	506	CNVHD	LDA	#5	;	CONVERT
0E86:	8D	92	507		STA	WRKPNTR	;	HEX
0E89:	A9	A1	508		LDA	#<CNVDEC	;	NUMBER
0E8B:	85	08	509		STA	W5L	;	TO
0E8D:	A9	B2	510		LDA	#>CNVDEC	;	DECIMAL
0E8F:	85	09	511		STA	W5H	;	SCREEN
0E91:	AD	9F	512		LDA	CNVHEX	;	OUTPUT
0E94:	8D	94	513		STA	W5L	;	CHARS
0E97:	AD	A0	514		LDA	CNVHEX+1		
			515					





0F41:	65	03	602	ADC	W2H	;MULPAND
0F43:	90	02	603	BCC	MPS1	
0F45:	E6	05	604	INC	W3H	;RSLHIGH
0F47:	88		605	DEY		
0F48:	D0	EF	606	BNE	MPL1	
0F4A:	85	04	607	STA	W3L	
0F4C:	A6	05	608	LDX	W3H	;RSLLOW
0F4E:	60		609	RTS		
0F4F:	20	B5	610			
0F52:	20	63	611	SCGET0	JSR	SSRCH
0F55:	20	61	612	SCGET02	JSR	SCCHNG
0F58:	20	61	613		JSR	SCODSPY
0F5B:	20	28	614		JSR	KYGET
0F5D:	C9	8D	615		CMP	#8D
0F5F:	F0	1D	616		BEG	SS2
0F62:	20	66	617		JSR	SCCHNG1
0F65:	20	D8	618		JSR	SCCHKARR
0F67:	F0	EB	619		BEG	SCGET02
0F69:	29	3F	620		AND	#3F
0F6A:	CD	76	621		CMP	SCNMBR
0F6C:	F0	0E	622		BEG	SS2
0F6E:	20	24	623		JSR	CHKY
0F71:	F0	06	624		BEG	SS1
0F73:	20	D5	625		JSR	BL
0F76:	4C	52	626		JMP	SCGET02
0F79:	20	61	627		JSR	SCODSPY
0F7C:	A5	0A	628	SS1	LDA	SCVP
0F7E:	38		629	SS2	SEC	
0F7F:	ED	77	630		SBC	SCPT
0F82:	AA		631		TAX	
0F83:	0A		632		ASLA	
0F84:	A8		633		TAY	
0F85:	60		634		RTS	
0F86:	85	02	635			
0F88:	84	04	636	SCVLSL	STA	W2L
0F8A:	84	06	637		STX	W3L
0F8C:	60		638		STY	W4L
0F8D:	85	03	639		RTS	
0F8F:	86	03	640	SCVLSHGT	STA	W2H
0F91:	84	07	641		STX	W3H
0F93:	20	E8	642		STY	W4H
0F96:	20	FE	643	SL1	JSR	SCVFILL
0F99:	20	99	644		JSR	SCFNLN
0F9C:	20	28	645		JSR	SCFLASH
0F9F:	20	99	646		JSR	KYGET
0FA2:	20	D8	647		JSR	SCFLASH
0FA5:	F0	0B	648		JSR	SCCHKARR
0FA7:	20	66	649		BEG	SS3
0FAA:	B0	0E	650		JSR	CHKNMBR
0FAC:	20	D5	651		BCC	GETVL
0FAF:	4C	96	652	SCE	JSR	BL
0FB2:	90	E2	653		JMP	SL1
0FB4:	A0	50	654	SS3	BCC	SL1
0FB6:	20	EA	655		LDY	#50
0FB9:	60		656		JSR	W1
0FBA:	AA		657		RTS	
0FBB:	AD	7D	658			
0FBE:	0A	B2	659	GETVL	TAX	
0FBF:	A8		660		LDA	SCVLPNT
0FC0:	B1	06	661		ASLA	
0FC2:	8A		662		TAY	
0FC3:	F0	E7	663		LDA	(W4L),Y
0FC5:	C8		664		TXA	
0FC6:	D1	06	665		BEG	SCE
0FC8:	B0	E2	666		INY	
0FCA:	AC	7D	667		CMP	(W4L),Y
0FCD:	91	02	668		BCC	SCE
0FCE:	20	DB	669		LDY	SCVLPNT
0FD2:	20	FB	670		STA	(W2L),Y
0FD5:	4C	B2	671		JSR	HADUT
			672		JSR	SS3
			673		JMP	SS3
			674			
0FD8:	AD	74	675	SCCHKARR	LDA	KYVALUE
0FDB:	C9	8B	676		CMP	#8B
0FDD:	F0	15	677		BEG	SS4
0FDF:	C9	88	678		CMP	#88
0FE1:	F0	11	679		BEG	SS4
0FE3:	C9	8A	680		CMP	#8A
0FE5:	F0	14	681		BEG	SS5
0FE7:	C9	95	682		CMP	#95
0FE9:	F0	10	683		BEG	SS5
0FEB:	C9	A0	684		CMP	#A0
0FED:	F0	0C	685		BEG	SS5
0FEF:	C9	8D	686		CMP	#8D
0FF1:	F0	08	687		BEG	SS5

;MANGER  
 ;GETTING  
 ;OPTION  
 ;FROM  
 ;SCREEN  
 ;TXNORML  
 ;CHKKEY  
 ;IF =  
 ;CURRENT  
 ;NOWAIST  
 ;DISPLAY  
 ;BOTTOM  
 ;CALC  
 ;PTN  
 ;MANAGER  
 ;GET VAL  
 ;FROM  
 ;SCREEN  
 ;GETDGT  
 ;CHECK  
 ;UP ARRW  
 ;LT ARRW  
 ;DN ARRW  
 ;RT ARRW  
 ;<SPACE>  
 ;<RETRN>

0FF3:	60			688		RTS		BNE IF
0FF4:	CE 7D	B2		689	SS4	DEC	SCVLPNT	NO
0FF7:	A9 FF			690		LDA	##FF	MATCH
0FF9:	D0 05			691		BNE	SCCALCD	
0FFB:	EE 7D	B2		692	SS5	INC	SCVLPNT	
0FFE:	A9 01			693		LDA	#1	
1000:	8D 7B	B2		694	SCCALCD	STA	SCDRCT	
1003:	AD 7B	B2		695	SCCALCD2	LDA	SCDRCT	BEQ &
1006:	18			696		CLC		CLC IF
1007:	65 0A			697		ADC	SCVP	MOVE OK
1009:	CD 77	B2		698		CMP	SCPT	
100C:	9D 0D			699		BCC	SS6	
100E:	CD 78	B2		700		CMP	SCP8	SEC IF
1011:	9D 0C			701		BCC	SS7	WRAP
1013:	18			702		CLC		AROUND
1014:	F0 09			703		BEQ	SS7	
1016:	AD 77	B2		704		LDA	SCPT	
1019:	D0 03			705		BNE	SS61	RST TOP
101B:	AD 78	B2		706	SS6	LDA	SCP8	RST BTM
101E:	38			707	SS61	SEC		
101F:	85 0A			708	SS7	STA	SCVP	
1021:	A9 00			709		LDA	#0	
1023:	60			710		RTS		
1024:	29 3F			711				
1026:	8D 7A	B2		712	SCHKY	AND	##3F	CHECK
1029:	A5 0A			713		STA	SCHKYVLU	CURRENT
102B:	8D 79	B2		714		LDA	SCVP	KEY
102E:	2D 66	10		715	SL2	STA	SCVP	PRESSED
1031:	AD 76	B2		716		JSR	SCCHNG1	TO SEE
1034:	CD 7A	B2		717		LDA	SCNMBR	IF IT'S
1037:	F0 20			718		CMP	SCHKYVLU	A VALID
1039:	2D 14	0E		719		BEQ	SCD1	OPTION
103C:	2D 66	10		720		JSR	W5	FROM
103F:	A5 0A			721		JSR	SCCHNG1	CURRENT
1041:	CD 78	B2		722		LDA	SCVP	MENU
1044:	F0 04			723		CMP	SCP8	
1046:	E6 0A			724		BEQ	SS8	
1048:	D0 03			725		INC	SCVP	
104A:	2D 5A	10		726	SS8	BNE	SS9	
104D:	2D 51	15		727	SS9	JSR	SSTOP	
1050:	A5 0A			728		JSR	SCVTAB	
1052:	CD 79	B2		729		LDA	SCVP	
1055:	D0 07			730		CMP	SCVP	
1057:	A9 FF			731		BNE	SL2	
1059:	60			732		LDA	##FF	BNE
				733	SCD1	RTS		BEQ
105A:	AD 77	B2		734				
105D:	85 0A			735	SSTOP	LDA	SCPT	
105F:	60			736		STA	SCVP	
				737		RTS		
1060:	2D 03	10		738				
1063:	2D 51	15		739	SL3	JSR	SCCALCD2	
1066:	AD 28			740	SCCHNG1	JSR	SCVTAB	
1068:	88			741	SL4	LDY	#40	IF LINE
1069:	3D F5			742		DEY		IS BLNK
106B:	B1 0C			743		BMI	SL3	CALC
106D:	29 3F			744		LDA	(SAL),Y	NEXT
106F:	49 20			745		AND	##3F	LINE
1071:	F0 F5			746		EOR	##20	
1073:	8C 93	B2		747		BEQ	SL4	OTHERWS
1076:	AD FF			748		STY	W5	CHANGE
1078:	C8			749		LDY	##FF	LINE
1079:	B1 0C			750	SL5	INY		TO
107B:	29 3F			751		LDA	(SAL),Y	OPITE
107D:	8D 76	B2		752		AND	##3F	
1080:	49 20			753		STA	SCNMBR	STR 1ST
1082:	F0 F4			754		EOR	##20	
1084:	88			755		BEQ	SL5	
1085:	C8			756		DEY		
1086:	B1 0C			757	SL6	INY		CHANGE
1088:	49 20			758		LDA	(SAL),Y	NORMAL
108A:	29 20			759		EOR	##20	TO
108C:	0A			760		AND	##20	INVERSE
108D:	09 80			761		ASLA		- OR -
108F:	51 0C			762		ORA	##80	INVERSE
1091:	91 0C			763		EOR	(SAL),Y	TO
1093:	CC 93	B2		764		STA	(SAL),Y	NORMAL
1096:	D0 ED			765		CPY	W5	
1098:	60			766		BNE	SL6	
				767		RTS		
1099:	2D CB	15		768				
109C:	2D F2	10		769	SCFLASH	JSR	RPH	TAKE
109F:	B1 0C			770		JSR	SSLN	CURRENT
10A1:	2D 66	15		771	SL7	LDA	(SAL),Y	LINE
10A4:	9D 0B			772		JSR	CHKNMBR	AND
				773		BCC	SCD2	TURN

10A6:	B1	0C	774		LDA	(SAL),Y	IT TO
10A8:	49	0C	775		EOR	#\$C0	FLASH
10AA:	91	0C	776		STA	(SAL),Y	
10AC:	84	0B	777		STY	SCHP	
10AE:	88		778		DEY		
10AF:	D0	EE	779		BNE	SL7	
10B1:	20	DD	780	SCD2	JSR	RPL	
10B4:	60		781		RTS		
10B5:	A9	17	783	SSRCH	LDA	#23	SEARCH
10B7:	85	0A	784		SCVP		SCREEN
10B9:	C6	0A	785	SL8	STA	SCVP	FOR
10BB:	20	F2	786		DEC	SCVP	LAST
10BE:	F0	F6	787		JSR	SSLN	LINE
10CF:	A5	0A	788		BEQ	SL8	OF
10C0:	8D	78	789		LDA	SCVP	MENU,
10C2:	A9	0A	790		STA	SCP8	THEN,
10C4:	85	0A	791		LDA	#10	FIRST
10C7:	E6	0A	792	SL9	STA	SCVP	LINE
10C9:	F0	F2	793		INC	SCVP	
10CB:	20	F2	794		JSR	SSLN	
10CE:	F0	F9	795		BEQ	SL9	
10D0:	A5	0A	796		LDA	SCVP	
10D2:	8D	77	797		STA	SCPT	
10D5:	60		798		RTS		
10D6:	A5	0A	799	SSFNLN	LDA	SCVP	FIND
10D8:	CD	78	800		CMP	SCP8	NEXT
10DB:	F0	08	801		BEQ	SCD3	VALID
10DD:	E6	0A	802		INC	SCVP	LINE
10DF:	20	F2	803		JSR	SSLN	
10E2:	F0	F2	804		BEQ	SSFNLN	
10E4:	18		805		CLC		CLC/
10E5:	60		806	SCD3	RTS		SEC
10E6:	20	03	807				
10E9:	20	F2	808	SL10	JSR	SCCALCD2	
10EC:	F0	F8	809	SCFNLN	JSR	SSLN	
10EE:	20	0A	810		BEQ	SL10	
10F1:	60		811		JSR	SCPNUMB1	
10F2:	20	51	812		RTS		
10F5:	A0	27	813	SSLN	JSR	SCVTAB	
10F7:	84	0B	814		LDY	#39	
10F9:	E6	0B	815	SL11	STY	SCHP	
10FB:	88		816		INC	SCHP	
10FC:	C0	FF	817		DEY		SEARCH
10FE:	F0	09	818		CPY	#\$FF	SCREEN
1100:	B1	0C	819		BEQ	SCD4	LINE
1102:	AA		820		LDA	(SAL),Y	FOR NON
1103:	29	3F	821		TAX		SPACE
1105:	C9	20	822		AND	#\$3F	BEQ =
1107:	F0	EE	823		CMP	#\$20	IF NO
1109:	60		824		BEQ	SL11	CHARS
110A:	B1	0C	825	SCD4	RTS		BEQ/BNE
110C:	29	3F	826				
110E:	C9	30	827	SCPNUMB1	LDA	(SAL),Y	GET THE
1110:	90	07	828		AND	#\$3F	NUMBER
1112:	C9	3A	829		CMP	#\$30	OF THE
1114:	B0	03	830		BCC	SCD5	CURRENT
1116:	88		831		CMP	#\$3A	OPTION
1117:	D0	F1	832		BCS	SCD5	FROM
1119:	C8		833	SCD5	DEY	SCPNUMB1	SCREEN
111A:	C8		834		BNE		
111B:	84	0B	835		INY		
111D:	60		836		INY		
111E:	A0	27	837		STY	SCHP	
1120:	B1	0C	838		RTS		
1122:	C9	A0	839	LNFLASH	LDY	#39	ACTUAL
1124:	F0	12	840	LFL1	LDA	(SAL),Y	FLASH
1126:	C9	BD	841		CMP	#\$A0	THE
1128:	F0	11	842		BEQ	LFS1	CURRENT
112A:	C9	BA	843		CMP	#"	SCREEN
112C:	F0	0D	844		BEQ	LFS2	LINE
112E:	C9	BF	845		CMP	#"	
1130:	F0	09	846		BEQ	LFS2	
1132:	29	3F	847		CMP	#"	
1134:	09	40	848		BEQ	LFS2	
1136:	91	0C	849		AND	#\$3F	
1138:	88		850	LFS1	ORA	#\$40	
1139:	D0	E5	851		STA	(SAL),Y	
113B:	60		852	LFS2	DEY		
113C:	A0	27	853		BNE	LFL1	
113E:	B1	0C	854	LNNORM	LDY	#39	TAKE
			855	LNL1	LDA	(SAL),Y	LINE

1140:	C9	A0	80			CMP	#\$A0		AND
1142:	FD	19	81			BEQ	LNS2		TURN
1144:	FD	BA	82			CMP	#"		IT BACK
1146:	FD	18	83			BEQ	LNS3		TO
1148:	FD	14	84			CMP	#\$3F		NORMAL
114A:	FD	00	85			BEQ	LNS3		
114C:	FD	00	86			CMP	#\$60		
114E:	FD	00	87			AND	#\$3F		
1150:	FD	00	88			STA	WS		
1152:	FD	00	89			LDA	#\$C0		
1154:	FD	00	90			BCC	LNS1		
1156:	FD	00	91			ASLA			
1158:	FD	93	92		LNS1	ORA	WS		
115A:	FD	0C	93			STA	(SAL),Y		
115C:	FD	DE	94		LNS2	DEY			
115E:	FD	60	95		LNS3	BNE	LNL1		
1160:	FD	60	96			RTS			
1161:	A5	0A	97		SCODSPLY	LDA	SCVP		DISPLY
1163:	48		98			PHA			SCRN
1164:	A9	04	99			LDA	#4		OPTION
1166:	20	05	15			JSR	TOUT		AT BTM
1168:	AD	76	B2			LDA	SCNMBR		OF SCRIN
116A:	09	80	20	16		ORA	#\$B0		
116C:	FE	20	20	16		JSR	COUT		THEN
1171:	68		53	15		PLA			RESET
1172:	20					JSR	SCVTAB1		SCREEN
1175:	60					RTS			PITNS
1176:	A9	C4			GTDRVD01	LDA	#"D"		DLT=DUP
1178:	20	95	11			JSR	SCGTDRV		GETDRV
117B:	A9	00				LDA	#0		DISPLAY
117D:	20	E1	11			JSR	SCDINSRT		INSERT
1180:	60					RTS			BLANK
1181:	A9	CF			GTDRVD02	LDA	#"0"		;DFT=ORG
1183:	20	95	11			JSR	SCGTDRV		
1184:	20	DE	11			JSR	SCDINSR1		
1189:	60					RTS			
118A:	A9	C4			BLNKIND	LDA	#"D"		INSRT
118C:	20	80	11			JSR	SETDRV		BLNK
118F:	A9	00				LDA	#0		INTO
1191:	20	E1	11			JSR	SCDINSRT		DUP
1194:	60					RTS			
1195:	8D	8F	B2		SCGTDRV	STA	DRVLETTR		GET
1198:	A9	09				LDA	#9		EITHER
119A:	20	05	15			JSR	TOUT		ORIGINAL
119D:	20	0D	12			JSR	SCDIND02		OR DUP
11A0:	4C	A6	11			JMP	SS10		DRIVE
11A3:	20	D5	0D		SL12	JSR	BL		
11A4:	20	D5	0D		SS10	JSR	KYGET		
11A6:	C9	8D	0D			CMP	#\$8D		;RTRN
11AB:	D0	03				BNE	SETDRV		
11AD:	AD	8F	B2		SETDRV2	LDA	DRVLETTR		
11B0:	AA				SETDRV	TAX			
11B1:	FD	C4				CMP	#"D"		
11B3:	FD	12				BEQ	SS12		
11B5:	FD	CF				CMP	#"0"		
11B7:	FD	00				BNE	SL12		
11B9:	AD	86	B2			LDA	CTRKO		SET UP
11BB:	85					STA	CTRK		ORIGINAL
11BC:	AD	80	B2			LDA	PDS		DRIVE
11BE:	AD	81	B2			LDY	PDD		
11C0:	AD	81	B2			JMP	STRCNT2		
11C2:	AD	87	B2		SS12	LDA	CTRKO		SET UP
11C4:	AD	87	B2			STA	CTRK		DUPLCT
11C6:	AD	85	B2			LDA	PDS		DRIVE
11C8:	AD	83	B2			LDY	PDD		
11CA:	FD	8F	B2		STRCNT2	STX	DRVLETTR		
11CC:	0A					ASLA			
11CE:	0A					ASLA			
11D0:	0A					ASLA			
11D2:	0A					ASLA			
11D4:	0A					ASLA			
11D6:	0A					ASLA			
11D8:	0A					ASLA			
11DA:	0A					ASLA			
11DC:	0A					ASLA			
11DE:	AD	8F	B2		SCDINSR1	LDA	DRVLETTR		
11E1:	A9	0A			SCDINSRT	PHA			INSERT
11E2:	20	05	15			LDA	#10		DISK
11E4:	20	05	15			JSR	TOUT		A=0,
11E6:	20	14	12			PLA			A=D
11E8:	20	05				JSR	SCDIND0		OR
11EB:	90	05				BCC	SS14		

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1200	AD 8B B2	0033		LDA TRACK	
1201	AD 4A 8B	0034		LSRA	
1202	AD 4A 8B	0035		LSRA	
1203	AD 20 7C 0E	0036		JSR CNVHAD	
1204	AD 00 00 00	0037		LDA CNVDEC+4	
1205	AD 00 00 00	0038		CMP #B4	
1206	AD 00 00 00	0039		BCC GNBS2	
1207	AD 00 00 00	0040		LDA #B0	
1208	AD 00 00 00	0041	GNBS2	STA CNVDEC+3	
1209	AD 00 00 00	0042		LDA KYVALUE	
1210	AD 00 00 00	0043		STA CNVDEC+4	
1211	AD 00 00 00	0044		JSR CNVDH	
1212	AD 00 00 00	0045		LDA CNVHEX	
1213	AD 00 00 00	0046		ASLA	
1214	AD 00 00 00	0047		ASLA	
1215	AD 00 00 00	0048		JMP GNBL	
1216	AD 00 00 00	0049			
1217	AD 00 00 00	0050	GETDEC	LDA TRACK	GET
1218	AD 00 00 00	0051		AND #3	HALF
1219	AD 00 00 00	0052		BNE GDL1	OR
1220	AD 00 00 00	0053		LDA #"	QUARTER
1221	AD 00 00 00	0054		JSR COUT	TRACK
1222	AD 00 00 00	0055	GDL1	JSR KYPRMPT	
1223	AD 00 00 00	0056		JSR GNBCHKD	
1224	AD 00 00 00	0057		LDY #3	
1225	AD 00 00 00	0058	GDL2	CMP LTQ,Y	
1226	AD 00 00 00	0059		BEQ GDS1	
1227	AD 00 00 00	0060		DEY	
1228	AD 00 00 00	0061		BPL GDL2	
1229	AD 00 00 00	0062		JMP GDL1	
1230	AD 00 00 00	0063	GDS1	LDA TRACK	DISPLAY
1231	AD 00 00 00	0064		AND #FC	CURRENT
1232	AD 00 00 00	0065		STA TRACK	TRACK
1233	AD 00 00 00	0066		TYA	VALUE
1234	AD 00 00 00	0067		QBA TRACK	AT
1235	AD 00 00 00	0068		STA TRACK	THIS
1236	AD 00 00 00	0069		JSR RHTAB	TIME
1237	AD 00 00 00	0070		JSR TRKOUT	
1238	AD 00 00 00	0071		LDA TRACK	
1239	AD 00 00 00	0072		AND #3	
1240	AD 00 00 00	0073		BEQ GNBL2	
1241	AD 00 00 00	0074		JMP GDL1	
1242	AD 00 00 00	0075			
1243	AD 00 00 00	0076	GNBCHKD	CMP #B0	DONE
1244	AD 00 00 00	0077		BEQ GNBCS1	GETTING
1245	AD 00 00 00	0078		CMP #B8	TRACK
1246	AD 00 00 00	0079		BNE GNBD	VALUE?
1247	AD 00 00 00	0080		SEC	
1248	AD 00 00 00	0081		BCS GNBC3	
1249	AD 00 00 00	0082	GNBCS1	CLC	
1250	AD 00 00 00	0083	GNBC3	PLA	
1251	AD 00 00 00	0084		PLA	
1252	AD 00 00 00	0085		LDA TRACK	
1253	AD 00 00 00	0086	GNBD	RTS	
1254	AD 00 00 00	0087			
1255	AD 00 00 00	0088	GETSYN	LDA #35	SYNC
1256	AD 00 00 00	0089		JSR GETYSNO	TRACKS?
1257	AD 00 00 00	0090		STY SYNCFLG	
1258	AD 00 00 00	0091		RTS	
1259	AD 00 00 00	0092	GETTIME	LDA #45	READ
1260	AD 00 00 00	0093		CLC	TIMING
1261	AD 00 00 00	0094		JSR GETYSNO	BITS?
1262	AD 00 00 00	0095		STY TIMEFLG	
1263	AD 00 00 00	0096		RTS	
1264	AD 00 00 00	0097	GETYSNO	PHP	DEFLT:
1265	AD 00 00 00	0098		JSR TOUT	
1266	AD 00 00 00	0099		JSR SHTAB	
1267	AD 00 00 00	0100		LDY #37	CLC=N
1268	AD 00 00 00	0101		PLP	SEC=Y
1269	AD 00 00 00	0102		BCC GSS1	
1270	AD 00 00 00	0103		DEY	
1271	AD 00 00 00	0104	GSS1	STY WS2	
1272	AD 00 00 00	0105		TYA	
1273	AD 00 00 00	0106		JSR TOUT	
1274	AD 00 00 00	0107		JSR RHTAB	
1275	AD 00 00 00	0108	GSL1	JSR KYPRMPT	
1276	AD 00 00 00	0109		CMP #B0	
1277	AD 00 00 00	0110		BEQ GSS3	
1278	AD 00 00 00	0111		LDY #37	
1279	AD 00 00 00	0112		CMP #N	
1280	AD 00 00 00	0113		BEQ GSS2	
1281	AD 00 00 00	0114		DEY	
1282	AD 00 00 00	0115		CMP #Y	
1283	AD 00 00 00	0116		BNE GSL1	
1284	AD 00 00 00	0117	GSS2	STY WS2	

1362:	98			118	TYA		
1363:	20	05	15	119	JSR	TOUT	
1364:	20	DB		120	LDA	#1	
1365:	A9	20	16	121	JSR	COUT	
1366:	A0	98	B2	122	LDA	WS2	
1367:	A0	01		123	LDY	#1	
1368:	20	25		124	CMR	#37	
1369:	00	01		125	BNE	GSS4	
1370:	88			126	DEF		
1371:	60			127	RTS		
				128			:0=NO
				129			:1=YES
1372:	20	92	00	130	NTRKCALC	JSR	K7
1373:	AD	8A	B2	131	LDA	STEP	
1374:	F0	25		132	BEQ	NTD1	
1375:	A5	89		133	LDA	CTRK	
1376:	F0	00	B2	134	CMR	ENDTRK	
1377:	F0	00		135	BEQ	NTD1	
1378:	80	00	B2	136	BEQ	NTD1	
1379:	80	00	B2	137	BEQ	STEP	
1380:	80	00	B2	138	CMR	ENDTRK	
1381:	80	00	B2	139	BEQ	NTD1	
1382:	80	00	B2	140	BEQ	NTD1	
1383:	80	00	B2	141	BEQ	CTRK	
1384:	80	00	B2	142	BEQ	NTD1	
1385:	80	00	B2	143	BEQ	CTRK	
1386:	80	00	B2	144	BEQ	NTD1	
1387:	80	00	B2	145	BEQ	CTRK	
1388:	80	00	B2	146	BEQ	NTD1	
1389:	80	00	B2	147	BEQ	CTRK	
1390:	80	00	B2	148	BEQ	NTD1	
1391:	80	00	B2	149	BEQ	CTRK	
1392:	80	00	B2	150	BEQ	NTD1	
1393:	80	00	B2	151	BEQ	CTRK	
1394:	80	00	B2	152	BEQ	NTD1	
1395:	80	00	B2	153	BEQ	CTRK	
1396:	80	00	B2	154	BEQ	NTD1	
1397:	80	00	B2	155	BEQ	CTRK	
1398:	80	00	B2	156	BEQ	NTD1	
1399:	80	00	B2	157	BEQ	CTRK	
1400:	80	00	B2	158	BEQ	NTD1	
1401:	80	00	B2	159	BEQ	CTRK	
1402:	80	00	B2	160	BEQ	NTD1	
1403:	80	00	B2	161	BEQ	CTRK	
1404:	80	00	B2	162	BEQ	NTD1	
1405:	80	00	B2	163	BEQ	CTRK	
1406:	80	00	B2	164	BEQ	NTD1	
1407:	80	00	B2	165	BEQ	CTRK	
1408:	80	00	B2	166	BEQ	NTD1	
1409:	80	00	B2	167	BEQ	CTRK	
1410:	80	00	B2	168	BEQ	NTD1	
1411:	80	00	B2	169	BEQ	CTRK	
1412:	80	00	B2	170	BEQ	NTD1	
1413:	80	00	B2	171	BEQ	CTRK	
1414:	80	00	B2	172	BEQ	NTD1	
1415:	80	00	B2	173	BEQ	CTRK	
1416:	80	00	B2	174	BEQ	NTD1	
1417:	80	00	B2	175	BEQ	CTRK	
1418:	80	00	B2	176	BEQ	NTD1	
1419:	80	00	B2	177	BEQ	CTRK	
1420:	80	00	B2	178	BEQ	NTD1	
1421:	80	00	B2	179	BEQ	CTRK	
1422:	80	00	B2	180	BEQ	NTD1	
1423:	80	00	B2	181	BEQ	CTRK	
1424:	80	00	B2	182	BEQ	NTD1	
1425:	80	00	B2	183	BEQ	CTRK	
1426:	80	00	B2	184	BEQ	NTD1	
1427:	80	00	B2	185	BEQ	CTRK	
1428:	80	00	B2	186	BEQ	NTD1	
1429:	80	00	B2	187	BEQ	CTRK	
1430:	80	00	B2	188	BEQ	NTD1	
1431:	80	00	B2	189	BEQ	CTRK	
1432:	80	00	B2	190	BEQ	NTD1	
1433:	80	00	B2	191	BEQ	CTRK	
1434:	80	00	B2	192	BEQ	NTD1	
1435:	80	00	B2	193	BEQ	CTRK	
1436:	80	00	B2	194	BEQ	NTD1	
1437:	80	00	B2	195	BEQ	CTRK	
1438:	80	00	B2	196	BEQ	NTD1	
1439:	80	00	B2	197	BEQ	CTRK	
1440:	80	00	B2	198	BEQ	NTD1	
1441:	80	00	B2	199	BEQ	CTRK	
1442:	80	00	B2	200	BEQ	NTD1	
1443:	80	00	B2	201	BEQ	CTRK	
1444:	80	00	B2	202	BEQ	NTD1	
1445:	80	00	B2	203	BEQ	CTRK	
1446:	80	00	B2	204	BEQ	NTD1	
1447:	80	00	B2	205	BEQ	CTRK	
1448:	80	00	B2	206	BEQ	NTD1	
1449:	80	00	B2	207	BEQ	CTRK	
1450:	80	00	B2	208	BEQ	NTD1	
1451:	80	00	B2	209	BEQ	CTRK	
1452:	80	00	B2	210	BEQ	NTD1	
1453:	80	00	B2	211	BEQ	CTRK	
1454:	80	00	B2	212	BEQ	NTD1	
1455:	80	00	B2	213	BEQ	CTRK	
1456:	80	00	B2	214	BEQ	NTD1	
1457:	80	00	B2	215	BEQ	CTRK	
1458:	80	00	B2	216	BEQ	NTD1	
1459:	80	00	B2	217	BEQ	CTRK	
1460:	80	00	B2	218	BEQ	NTD1	
1461:	80	00	B2	219	BEQ	CTRK	
1462:	80	00	B2	220	BEQ	NTD1	
1463:	80	00	B2	221	BEQ	CTRK	
1464:	80	00	B2	222	BEQ	NTD1	
1465:	80	00	B2	223	BEQ	CTRK	
1466:	80	00	B2	224	BEQ	NTD1	
1467:	80	00	B2	225	BEQ	CTRK	
1468:	80	00	B2	226	BEQ	NTD1	
1469:	80	00	B2	227	BEQ	CTRK	
1470:	80	00	B2	228	BEQ	NTD1	
1471:	80	00	B2	229	BEQ	CTRK	
1472:	80	00	B2	230	BEQ	NTD1	
1473:	80	00	B2	231	BEQ	CTRK	
1474:	80	00	B2	232	BEQ	NTD1	
1475:	80	00	B2	233	BEQ	CTRK	
1476:	80	00	B2	234	BEQ	NTD1	
1477:	80	00	B2	235	BEQ	CTRK	
1478:	80	00	B2	236	BEQ	NTD1	
1479:	80	00	B2	237	BEQ	CTRK	
1480:	80	00	B2	238	BEQ	NTD1	
1481:	80	00	B2	239	BEQ	CTRK	
1482:	80	00	B2	240	BEQ	NTD1	
1483:	80	00	B2	241	BEQ	CTRK	
1484:	80	00	B2	242	BEQ	NTD1	
1485:	80	00	B2	243	BEQ	CTRK	
1486:	80	00	B2	244	BEQ	NTD1	
1487:	80	00	B2	245	BEQ	CTRK	
1488:	80	00	B2	246	BEQ	NTD1	
1489:	80	00	B2	247	BEQ	CTRK	
1490:	80	00	B2	248	BEQ	NTD1	
1491:	80	00	B2	249	BEQ	CTRK	
1492:	80	00	B2	250	BEQ	NTD1	
1493:	80	00	B2	251	BEQ	CTRK	
1494:	80	00	B2	252	BEQ	NTD1	
1495:	80	00	B2	253	BEQ	CTRK	
1496:	80	00	B2	254	BEQ	NTD1	
1497:	80	00	B2	255	BEQ	CTRK	
1498:	80	00	B2	256	BEQ	NTD1	
1499:	80	00	B2	257	BEQ	CTRK	
1500:	80	00	B2	258	BEQ	NTD1	
1501:	80	00	B2	259	BEQ	CTRK	
1502:	80	00	B2	260	BEQ	NTD1	
1503:	80	00	B2	261	BEQ	CTRK	
1504:	80	00	B2	262	BEQ	NTD1	
1505:	80	00	B2	263	BEQ	CTRK	
1506:	80	00	B2	264	BEQ	NTD1	
1507:	80	00	B2	265	BEQ	CTRK	
1508:	80	00	B2	266	BEQ	NTD1	
1509:	80	00	B2	267	BEQ	CTRK	
1510:	80	00	B2	268	BEQ	NTD1	
1511:	80	00	B2	269	BEQ	CTRK	
1512:	80	00	B2	270	BEQ	NTD1	
1513:	80	00	B2	271	BEQ	CTRK	
1514:	80	00	B2	272	BEQ	NTD1	
1515:	80	00	B2	273	BEQ	CTRK	
1516:	80	00	B2	274	BEQ	NTD1	
1517:	80	00	B2	275	BEQ	CTRK	
1518:	80	00	B2	276	BEQ	NTD1	
1519:	80	00	B2	277	BEQ	CTRK	
1520:	80	00	B2	278	BEQ	NTD1	
1521:	80	00	B2	279	BEQ	CTRK	
1522:	80	00	B2	280	BEQ	NTD1	
1523:	80	00	B2	281	BEQ	CTRK	
1524:	80	00	B2	282	BEQ	NTD1	
1525:	80	00	B2	283	BEQ	CTRK	
1526:	80	00	B2	284	BEQ	NTD1	
1527:	80	00	B2	285	BEQ	CTRK	
1528:	80	00	B2	286	BEQ	NTD1	
1529:	80	00	B2	287	BEQ	CTRK	
1530:	80	00	B2	288	BEQ	NTD1	
1531:	80	00	B2	289	BEQ	CTRK	
1532:	80	00	B2	290	BEQ	NTD1	
1533:	80	00	B2	291	BEQ	CTRK	
1534:	80	00	B2	292	BEQ	NTD1	
1535:	80	00	B2	293	BEQ	CTRK	
1536:	80	00	B2	294	BEQ	NTD1	
1537:	80	00	B2	295	BEQ	CTRK	
1538:	80	00	B2	296	BEQ	NTD1	
1539:	80	00	B2	297	BEQ	CTRK	
1540:	80	00	B2	298	BEQ	NTD1	
1541:	80	00	B2	299	BEQ	CTRK	
1542:	80	00	B2	300	BEQ	NTD1	
1543:	80	00	B2	301	BEQ	CTRK	
1544:	80	00	B2	302	BEQ	NTD1	
1545:	80	00	B2	303	BEQ	CTRK	
1546:	80	00	B2	304	BEQ	NTD1	
1547:	80	00	B2	305	BEQ	CTRK	
1548:	80	00	B2	306	BEQ	NTD1	
1549:	80	00	B2	307	BEQ	CTRK	
1550:	80	00	B2	308	BEQ	NTD1	
1551:	80	00	B2	309	BEQ	CTRK	
1552:	80	00	B2	310	BEQ	NTD1	
1553:	80	00	B2	311	BEQ	CTRK	
1554:	80	00	B2	312	BEQ	NTD1	
1555:	80	00	B2	313	BEQ	CTRK	
1556:	80	00	B2	314	BEQ	NTD1	
1557:	80	00	B2	315	BEQ	CTRK	
1558:	80	00	B2	316	BEQ	NTD1	
1559:	80	00	B2	317	BEQ	CTRK	
1560:	80	00	B2	318	BEQ	NTD1	
1561:	80	00	B2	319	BEQ	CTRK	
1562:	8						

140E: 60		1204	RTS		
140F: A9 00		1205			
1411: 8D 98 B2		1206	EPCLEAN LDA #0	:ERASE	
1414: 20 A7 13		1207	STA WS2	:CURRENT	
1417: 20 43 14		1208	EPCL1 JSR EPCALC1	:E/P	
141A: C9 40		1209	JSR EPIN	:CODES	
141C: B0 05		1210	CMP ##40		
141E: A9 A0		1211	BCS EPCS1		
1420: 20 35 14		1212	LDA ##A0		
1423: EE 98 B2		1213	JSR EPQUT		
1426: AD 98 B2		1214	INC WS2		
1429: C9 90		1215	LDA WS2		
142B: D0 E7		1216	CMP ##90		
142D: 20 A5 13		1217	BNE EPCL1		
1430: 60		1218	JSR EPCALC	:RESET	
		1219	RTS		
1431: 08		1220			
1432: A9 A0		1221	EPBOUT PHP	:BLANK	
1434: 28		1222	LDA ##A0	:OUT	
1435: 08		1223	PLP		
1436: 48		1224	EPQUT PHP		
1437: 20 4E 14		1225	PHA		
143A: 68		1226	JSR EPR1		
143B: 20 20 16		1227	PLA		
143E: 20 64 14		1228	JSR COUT		
1441: 28		1229	JSR EPR2		
1442: 60		1230	PLP		
1443: 20 4E 14		1231	RTS		
1446: B1 0C		1232	EPIN JSR EPR1	:E/P IN	
1448: 48		1233	LDA (SAL),Y	:READ	
1449: 20 64 14		1234	PHA	:SCREEN	
144C: 68		1235	JSR EPR2		
144D: 60		1236	PLA		
144E: A5 0A		1237	RTS		
1450: 8D 9D B2		1238	EPR1 LDA SCVP		
1453: A5 0B B2		1239	STA EPTSV		
1455: 8D 9E B2		1240	LDA SCHP		
1458: AD 9B B2		1241	STA EPTSH		
145B: 20 53 15		1242	LDA EPV		
145E: AC 9C B2		1243	JSR SCVTAB1		
1461: 84 0B		1244	LDY EPH		
1463: 60		1245	STY SCHP		
1464: AD 9D B2		1246	RTS		
1467: 20 53 15		1247	EPR2 LDA EPTSV		
146A: AD 9E B2		1248	JSR SCVTAB1		
146D: 85 0B		1249	LDA EPTSH		
146F: 60		1250	STA SCHP		
		1251	RTS		
1470: 20 79 14		1252			
1473: A9 0B		1253	TRKOUT JSR TRKOUT1		
1475: 20 20 16		1254	LDA #*C*		
1478: 60		1255	JSR COUT		
1479: AD 8B B2		1256	RTS		
147C: 85 16		1257	TRKOUT1 LDA TRACK	:DISPLAY	
147E: A9 00		1258	STA HXL	:TRACK	
1480: 85 17		1259	LDA #0	:NUMBER	
1482: 46 16		1260	STA HXH		
1484: 6A		1261	LSR HXL		
1485: 46 16		1262	RORA		
1487: 6A		1263	LSR HXL		
1488: 85 15		1264	RORA		
148A: 20 A5 14		1265	STA HXF		
148D: AD A5 B2		1266	JSR NMBFOUT2	:HNDRTHS	
1490: C9 B0		1267	LDA CNUDEC+4		
1492: F0 03		1268	CMP ##80		
1494: 20 20 16		1269	BEQ TRS1		
1497: 60		1270	JSR COUT		
		1271	RTS		
1498: 20 FE 15		1272			
149B: 20 E3 14		1273	RPMOUT JSR SHTAB	:DISPLY	
149E: 20 BF 14		1274	JSR HOUT	:DRIVE	
14A1: A9 14		1275	JSR TNTHCLCO	:SPEED	
14A3: 20 05 15		1276	LDA #20	:IN RPMS	
14A6: 20 07 16		1277	JSR TOUT		
14A9: 60		1278	JSR RHTAB		
14AA: A5 16		1279	RTS		
14AC: A6 17		1280	NMBFOUT2 LDA HXL	:DISPLY	
14AE: 20 D0 14		1281	LDX HXH	:WHOLE	
14B1: A5 15		1282	JSR HXAOUT	:NUMBERS	
14B3: 85 04		1283	LDA HXF	:AND	
14B5: A9 01		1284	STA W3L	:FRCTN	
14B7: 85 01		1285	LDA #1		
14B9: A9 00		1286	STA W1H		
14BB: 85 05		1287	LDA #0		
14BD: 85 00		1288	STA W3H		
		1289	STA W1L		



14BF	20	D4	0E	1290	TNTHCLCO	JSR	CALCF2		
14C2	AD	A4	B2	1291		LDA	CNVDEC+3		
14C5	B0			1292		CMP	#\$B0		
14C7	11			1293		BEQ	NMS2		
14C9	A9	AE		1294	TNTHSOUT	LDA	#"		
14CB	20		16	1295		JSR	COUT		
14CE	99	F	B2	1296		LDA	CNVHEX		
14D1	8D	A6	B2	1297		STA	TEMPE		
14D4	AD	A4	B2	1298		LDA	CNVDEC+3		;TENTHS
14D7	20	20	16	1299		JSR	COUT		
14DA	60			1300	NMS2	RTS			
14DB	A2	00		1301	HAOUT	LDX	#0		:DISPLY
14DD	20	7E	0E	1302	HXAOUT	JSR	CNVHXAD		:HEX
14E0	20	84	14	1303		JMP	DOUT		:NUMBER
14E3	A2	84	0E	1304	HOUT	JSR	CNVHD		
14E6	A2	00		1305	DOUT	LDX	#0		:DISPLY
14E8	8D	00		1306		LDA	#\$B0		:DECIML
14EA	8D	00	B2	1307		STA	WS		:NUMBER
14ED	8D	00	B2	1308	DOL1	LDA	CNVDEC,X		
14F0	20	00		1309		CPX	#4		
14F2	77	00	B2	1310		BEQ	DOS1		
14F4	77	00	B2	1311		CMP	WS		
14F7	77	00	16	1312	DOS1	BEQ	DOS2		
14FA	77	00	B2	1313	DOS2	JSR	COUT		
14FD	00	00		1314		STX	WS		
1500	00	00		1315		INX			
1502	00	00		1316		CPX	#5		
1504	00	00		1317		BNE	DOL1		
1506	00	00		1318		RTS			
1508	00	00		1319					
150A	00	00		1320					
150C	00	00		1321					
150E	00	00		1322					
1510	00	00		1323					
1512	00	00		1324					
1514	00	00		1325					
1516	00	00		1326					
1518	00	00		1327					
151A	00	00		1328					
151C	00	00		1329					
151E	00	00		1330					
1520	00	00		1331					
1522	00	00		1332					
1524	00	00		1333					
1526	00	00		1334					
1528	00	00		1335					
152A	00	00		1336					
152C	00	00		1337					
152E	00	00		1338					
1530	00	00		1339					
1532	00	00		1340					
1534	00	00		1341					
1536	00	00		1342					
1538	00	00		1343					
153A	00	00		1344					
153C	00	00		1345					
153E	00	00		1346					
1540	00	00		1347					
1542	00	00		1348					
1544	00	00		1349					
1546	00	00		1350					
1548	00	00		1351					
154A	00	00		1352					
154C	00	00		1353					
154E	00	00		1354					
1550	00	00		1355					
1552	00	00		1356					
1554	00	00		1357					
1556	00	00		1358					
1558	00	00		1359					
155A	00	00		1360					
155C	00	00		1361					
155E	00	00		1362					
1560	00	00		1363					
1562	00	00		1364					
1564	00	00		1365					
1566	00	00		1366					
1568	00	00		1367					
156A	00	00		1368					
156C	00	00		1369					
156E	00	00		1370					
1570	00	00		1371					
1572	00	00		1372					
1574	00	00		1373					
1576	00	00		1374					
1578	00	00		1375					
157A	00	00		1376					
157C	00	00		1377					
157E	00	00		1378					
1580	00	00		1379					
1582	00	00		1380					
1584	00	00		1381					
1586	00	00		1382					
1588	00	00		1383					
158A	00	00		1384					
158C	00	00		1385					
158E	00	00		1386					
1590	00	00		1387					
1592	00	00		1388					
1594	00	00		1389					
1596	00	00		1390					
1598	00	00		1391					
159A	00	00		1392					
159C	00	00		1393					
159E	00	00		1394					
15A0	00	00		1395					
15A2	00	00		1396					
15A4	00	00		1397					
15A6	00	00		1398					
15A8	00	00		1399					
15AA	00	00		1400					
15AC	00	00		1401					
15AE	00	00		1402					
15B0	00	00		1403					
15B2	00	00		1404					
15B4	00	00		1405					
15B6	00	00		1406					
15B8	00	00		1407					
15BA	00	00		1408					
15BC	00	00		1409					
15BE	00	00		1410					
15C0	00	00		1411					
15C2	00	00		1412					
15C4	00	00		1413					
15C6	00	00		1414					
15C8	00	00		1415					
15CA	00	00		1416					
15CC	00	00		1417					
15CE	00	00		1418					
15D0	00	00		1419					
15D2	00	00		1420					
15D4	00	00		1421					
15D6	00	00		1422					
15D8	00	00		1423					
15DA	00	00		1424					
15DC	00	00		1425					
15DE	00	00		1426					
15E0	00	00		1427					
15E2	00	00		1428					
15E4	00	00		1429					
15E6	00	00		1430					
15E8	00	00		1431					
15EA	00	00		1432					
15EC	00	00		1433					
15EE	00	00		1434					
15F0	00	00		1435					
15F2	00	00		1436					
15F4	00	00		1437					
15F6	00	00		1438					
15F8	00	00		1439					
15FA	00	00		1440					
15FC	00	00		1441					
15FE	00	00		1442					
1600	00	00		1443					
1602	00	00		1444					
1604	00	00		1445					
1606	00	00		1446					
1608	00	00		1447					
160A	00	00		1448					
160C	00	00		1449					
160E	00	00		1450					
1610	00	00		1451					
1612	00	00		1452					
1614	00	00		1453					
1616	00	00		1454					
1618	00	00		1455					
161A	00	00		1456					
161C	00	00		1457					
161E	00	00		1458					
1620	00	00		1459					
1622	00	00		1460					
1624	00	00		1461					
1626	00	00		1462					
1628	00	00		1463					
162A	00	00		1464					
162C	00	00		1465					
162E	00	00		1466					
1630	00	00		1467					
1632	00	00		1468					
1634	00	00		1469					
1636	00	00		1470					
1638	00	00		1471					
163A	00	00		1472					
163C	00	00		1473					
163E	00	00		1474					
1640	00	00		1475					
1642	00	00		1476					
1644	00	00		1477					
1646	00	00		1478					
1648	00	00		1479					
164A	00	00		1480					
164C	00	00		1481					
164E	00	00		1482					
1650	00	00		1483					
1652	00	00		1484					
1654	00	00		1485					
1656									

1572:	60			1376	RTS		;CLC=NO
1573:	A9	FF		1377			
1575:	A0	00		1378	SETBS	LDA	;\$FF
1577:	20	83	15	1379		LDY	#0
157A:	A9	AA		1380		JSR	SETBV
157C:	80	FF	93	1381		LDA	;\$AA
157F:	80	FF	93	1382		STA	;\$93FE
1582:	60			1383		STA	;\$93FF
				1384		RTS	
				1385			
1583:	80	93	B2	1386	SETBV	STA	WS
1586:	8C	98	B2	1387		STY	WS2
1589:	A9	78		1388		LDA	;\$78
158B:	85	01		1389		STA	;\$1
158D:	A9	94		1390		LDA	;\$94
158F:	85	03		1391		STA	;\$3
1591:	A0	00		1392		LDY	#0
1593:	84	00		1393		STY	#0
1595:	84	02		1394		STY	;\$2
1597:	A0	93	B2	1395	SE1	LDA	WS
1599:	91	00		1396		STA	(\$0),Y
159C:	A0	98	B2	1397		LDA	WS2
159F:	91	02		1398		STA	(\$2),Y
15A1:	C8			1399		INY	
15A2:	D0	F3		1400		BNE	SE1
15A4:	EE	03		1401		INC	;\$3
15A6:	EE	01		1402		INC	;\$1
15A8:	A5	03		1403		LDA	;\$3
15AA:	C9	B0		1404		CMP	;\$B0
15AC:	D0	EE		1405		BNE	SE1
15AE:	A9	FF		1406		LDA	;\$FF
15B0:	80	90	B2	1407		STA	TLENL
15B3:	A9	18		1408		LDA	;\$18
15B5:	80	91	B2	1409		STA	TLENH
15B8:	60			1410		RTS	
				1411			
15B9:	20	99	17	1412	PDONE	JSR	MTROFF
15BC:	A9	18		1413	PDONE1	LDA	;\$24
15BD:	20	05	15	1414		JSR	TOUT
15C1:	20	D5	00	1415		JSR	BL
15C4:	20	22	00	1416		JSR	KYCLRGET
15C7:	2C	51	C0	1417		BIT	;\$C051
15CA:	60			1418		RTS	
				1419			
15CB:	08			1420	RPH	PHP	
15CC:	80			1421		STA	RA
15CE:	8C	6E	B2	1422		STY	RY
15D0:	8E	70	B2	1423		STX	RX
15D3:	68			1424		PLA	
15D6:	80	71	B2	1425		STA	RP
15D9:	A0	6E	B2	1426		LDA	RA
15DC:	60			1427		RTS	
				1428			
15DD:	A0	71	B2	1429	RPL	LDA	RP
15E0:	48			1430		PHA	
15E1:	A0	6E	B2	1431		LDA	RA
15E3:	AC	6F	B2	1432		LDY	RY
15E5:	AE	70	B2	1433		LDX	RX
15E8:	28			1434		PLP	
15EB:	60			1435		RTS	
				1436			
15EC:	A6	0A		1437	SVTAB	LDX	SCVP
15EE:	8E	72	B2	1438		STX	LVP
15F1:	60			1439		RTS	
15F2:	AE	72	B2	1440	RVTAB	LDX	LVP
15F5:	86	0A		1441		STX	SCVP
15F7:	20	51	15	1442		JSR	SCVTAB
15FA:	60			1443		RTS	
				1444			
15FB:	20	EC	15	1445	PUSHTAB	JSR	SVTAB
15FE:	A6	0B		1446	SHTAB	LDX	SCHP
1600:	8E	73	B2	1447		STX	LASTHP
1603:	60			1448		RTS	
1604:	20	F2	15	1449	PULLTAB	JSR	RVTAB
1607:	AE	73	B2	1450	RHTAB	LDX	LASTHP
160A:	86	0B		1451		STX	SCHP
160C:	60			1452		RTS	
				1453			
160D:	48			1454	ERSBTM	PHA	
160E:	20	FB	15	1455		JSR	PUSHTAB
1611:	A9	16		1456		LDA	;\$22
1613:	20	53	15	1457		JSR	SCVTAB1
1616:	A9	DE		1458		LDA	;\$XX
1618:	20	20	16	1459		JSR	COUT
161B:	20	04	16	1460		JSR	PULLTAB
161E:	68			1461		PLA	

161F: 60		1462	RTS		
620: 20 CB 15		1463			
623: A0 16		1464	COUT JSR RPH	CHARCTR	
625: C9 DF		1465	LDY #22	OUTPUT	
627: F0 4B		1466	CMP #"-"	SCREEN	
629: C9 E0		1467	BEQ C1	ROUTINE	
62B: F0 46		1468	CMP #"-"		
62D: C9 FE		1469	BEQ C2		
62F: F0 03		1470	CMP #"-"		
631: A4 0B		1471	BEQ PULLTAB		
633: C9 DD		1472	LDY SCHP		
635: F0 46		1473	CMP #"]"		
637: C9 DB		1474	BEQ C3		
639: F0 42		1475	CMP #"[		
63B: C9 A6		1476	BEQ C3		
63D: F0 5E		1477	CMP #"&"		
63F: C9 DE		1478	BEQ C4		
641: F0 47		1479	CMP #"^"		
643: AE CA B2		1480	BEQ C5		
646: F0 08		1481	LDX EDDVRSN		
648: A6 20		1482	BEQ C6		
64A: F0 FF		1483	LDX VMODE		
64C: F0 21		1484	CPX #FF		
64E: D0 06		1485	BEQ CD		
650: A6 20		1486	BNE C7		
652: F0 01		1487	LDX VMODE		
654: F0 19		1488	CPX #1		
656: 91 0C		1489	BEQ CD		
658: E6 0B		1490	STA (SAL),Y		
65A: A5 0B		1491	INC SCHP		
65C: C9 28		1492	LDA SCHP		
65E: D0 0F		1493	CMP #40		
660: A9 00		1494	BNE CD		
662: A5 0B		1495	LDA #0		
664: A5 0A		1496	STA SCHP		
666: C9 17		1497	LDA SCVP		
668: F0 05		1498	CMP #23		
66A: E6 0A		1499	BEQ CD		
66C: 20 51 15		1500	INC SCVP		
66F: 20 DD 15		1501	JSR SCVTAB		
672: 60		1502	JSR RPL		
673: 88		1503	RTS		
674: 20 FB 15		1504	DEY		
677: 98		1505	JSR C1	PUSHTAB	
678: 85 0A		1506	TYA		
67A: 4C 60 16		1507	STA SCVP		
67D: 20 AC 16		1508	JMP C8		
680: AD 6E B2		1509	JSR C9		
683: C9 DD		1510	LDA RA		
685: D0 E8		1511	CMP #"]"		
687: 4C 60 16		1512	BNE CD		
68A: 20 AC 16		1513	JMP C8		
68D: A5 0A		1514	JSR C9		
68F: C9 17		1515	LDA SCVP		
691: F0 0A		1516	CMP #23		
693: E6 0A		1517	BEQ C4		
695: 20 51 15		1518	INC SCVP		
698: A0 00		1519	JSR SCVTAB		
69A: 4C 8A 16		1520	LDY #0		
69D: AD 75 B2		1521	JMP C5		
6A0: 85 0A		1522	LDA TWINDTOP ;WINDOW		
6A2: A9 00		1523	STA SCVP		
6A4: 85 0B		1524	LDA #0		
6A6: 20 51 15		1525	STA SCHP		
6A9: 4C 6F 16		1526	JSR SCVTAB		
6AC: A9 A0		1527	JMP CD		
6AE: 91 0C		1528	LDA #A0		
6B0: C8		1529	STA (SAL),Y		
6B1: C0 28		1530	INY		
6B3: D0 F9		1531	CPY #40		
6B5: 60		1532	BNE C91		
		1533	RTS		
		1534			
		1535			
		1536			
		1537			
		1538			
		1539			
		1540			
6B6: 26 19		1541	LTEDD0 DA COPYDISK		1
6B8: C3 17		1542	DA CHNGPAM		2
6BA: 03 21		1543	DA DRVSPEED		3
6BC: 03 1D		1544	DA SCANDISK		4
6BE: 00 1D		1545	DA CERTDISK		5
6C0: AF 0C		1546	DA CHNGSLTS		6
6C2: 00 21		1547	DA DRVEXAM		7

16C4:	A7	0C	548	DA	CLRERRCD	18
16C6:	D1	0C	549	DA	EDDQUIT	19
16C8:	E2	0C	550			
16CA:	6B	0C	551	LTQT	DA	QUITEDD
			552	DA	E2	19-1
			553			19-2
			554	*****		
			555	*-----*		
			556	* DRIVE ROUTINES DRIVERS *		
			557	*-----*		
			558			
16CC:	08		559	TRKWRTER	PHP	
16CD:	A9	15	560		LDA	#21
16CE:	8D	98	561		STA	WS2
16D0:	20		562		PLP	
16D2:	20		563		JSR	WPEDO
16D3:	20	4C	564		JSR	CHKESC
16D6:	20	C9	565	TRKWRT	LDA	#17
16D9:	A9	17	566		JSR	EPOUT
16DB:	20	35	567		LDY	TLENL
16DE:	AC	90	568		LDA	TLENH
16E1:	AD	91	569		JSR	WRITETRK
16E4:	20	18	570		BCS	TRKWRTER
16E7:	80	E3	571	WPD	RTS	
16E9:	60		572			
			573			
16EA:	A9	17	574	CHKNW	LDA	#23
16EC:	8D	98	575		STA	WS2
16ED:	A6	10	576	CN	LDX	CSLT
16F1:	BD	80	577		LDA	\$C08D,X
16F4:	BD	80	578		LDA	\$C08E,X
16F7:	10	F0	579		BPL	WPD
16F9:	20	4C	580		JSR	WPEDO
16FC:	4C	FF	581		JMP	CN
16FE:	A9	17	582	WP1	LDA	#23
701:	80	90	583	WPOCHK	STA	WS2
704:	AC	8F	584		LDY	DRVLETTR
707:	FC	0C	585		CPY	#D
709:	FC	0C	586		BEQ	WPD
70B:	A6	10	587	WP2	LDX	CSLT
70D:	BD	80	588		LDA	\$C08D,X
710:	BD	80	589		LDA	\$C08E,X
713:	30	06	590		BMI	WPD0
715:	20	4C	591		JSR	WPEDO
718:	4C	08	592		JMP	WP2
			593			
71B:	AD	CA	594	WPD0	LDA	EDDVRSN
71E:	FC	0C	595		BEQ	WPD
720:	AD	86	596		LDA	CTRKO
723:	FC	04	597		BEQ	WP3
725:	FC	FF	598		CMP	#FF
727:	00	C0	599		BNE	WPD
729:	20	27	600	WP3	JSR	PCRDCHK
72C:	90	80	601		BCC	WPD
72E:	20	99	602		JSR	MTR0FF
731:	A9	38	603		LDA	#59
733:	20	05	604		JSR	TOUT
736:	AD	80	605		LDA	POS
739:	09	B0	606		ORA	#B0
73B:	80	73	607		STA	#873
73E:	AD	84	608		LDA	DCCSLOT
741:	09	B0	609		ORA	#B0
743:	80	3A	610		STA	#B3A
746:	20	22	611		JSR	KYCLRGET
749:	4C	AF	612		JMP	CHNGSLTS
			613			
74C:	08		614	WPEDO	PHP	
74D:	20	FB	615		JSR	PUSHTAB
750:	20	99	616		JSR	MTR0FF
753:	AD	98	617		LDA	WS2
756:	20	53	618		JSR	SCUTAB1
759:	A9	1B	619		LDA	#27
75B:	28		620		PLP	
75C:	30	02	621		BMI	WPS1
75E:	A9	1A	622		LDA	#26
760:	20	05	623	WPS1	JSR	TOUT
763:	20	05	624		JSR	BL
766:	20	22	625		JSR	KYCLRGET
769:	A9	00	626		LDA	#0
76B:	85	0B	627		STA	SCHP
76D:	A9	0B	628		LDA	#I
76F:	20	20	629		JSR	COUT
772:	20	04	630		JSR	MTRON
775:	20		631		JSR	PULLTAB
778:	60		632		RTS	
			633			

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1779: 20 82 17 1634 MTRONCW JSR MTRON ;MOTORON
177C: A9 15 1635 LDA #21 ;CHECK
177E: 20 01 17 1636 JSR WPOCHK ;ORIGINAL
1781: 60 1637 RTS ;DISK
1782: 20 92 00 1638
1785: 20 AD 11 1639 MTRON JSR K7 ;TURN
1788: A6 10 1640 JSR SETDRV2 ;DRIVE
178A: BD 89 C0 1641 LDX CSLT ;MOTOR
178D: 8A 1642 LDA $C089,X ;ON
178E: 18 1643 TXA ;ROUTINE
178F: 65 11 1644 CLC
1791: AA 1645 ADC CDRV
1792: BD 89 C0 1646 TAX
1795: 20 06 0E 1647 LDA $C089,X
1798: 60 1648 JSR W3
1799: A6 10 1649 RTS
179B: BD 88 C0 1650
179E: 60 1651 MTROFF LDX CSLT ;TURN
179F: 20 99 17 1652 LDA $C088,X ;MOTOR
17A2: 20 05 00 1653 RTS ;OFF
17A5: 20 28 00 1654
17A8: 20 82 17 1655 ZX JSR MTROFF
17AB: A9 00 1656 JSR BL
17AD: 20 06 B7 1657 JSR KYGET
17B0: A9 AA 1658 JSR MTRON ;MOTORON
17B2: A0 00 1659 LDA #0 ;AND
17B4: 20 83 15 1660 JSR ARMV ;VERIFY
17B7: 20 D6 16 1661 LDA #$AA ;THE
17BA: 20 0F B7 1662 LDY #0 ;BLANK
17BD: B0 E0 1663 JSR SETBV ;DISK
17BF: 20 0D 16 1664 JSR TRKWRT
17C2: 60 1665 JSR TRKV1
1634 MTRONCW JSR ERSBTM
1635 LDA #21
1636 JSR WPOCHK
1637 RTS
1638
1639 MTRON JSR K7
1640 JSR SETDRV2
1641 LDX CSLT
1642 LDA $C089,X
1643 TXA
1644 CLC
1645 ADC CDRV
1646 TAX
1647 LDA $C089,X
1648 JSR W3
1649 RTS
1650
1651 MTROFF LDX CSLT
1652 LDA $C088,X
1653 RTS
1654
1655 ZX JSR MTROFF
1656 JSR BL
1657 JSR KYGET
1658 JSR MTRON
1659 LDA #0
1660 JSR ARMV
1661 LDA #$AA
1662 LDY #0
1663 JSR SETBV
1664 JSR TRKWRT
1665 JSR TRKV1
1666 BCS ZX
1667 JSR ERSBTM
1668 RTS
1669
1670 *-----*
1671
1672 *****
1673 * CHANGE PARAMETERS OPTION *
1674 *****
1675
1676 CHNGPARM LDA #49 ;CHANGE
1677 JSR TOUT ;PARMS
1678 CPL1 JSR SCGET0 ;OPTION
1679 TXA
1680 CMP #3
1681 BCC CP
1682 CMP #4
1683 BNE CS1
1684 RTS ;END
1685
1686 CS1 LDY #0 ;RESET
1687 CL2 LDA PARMSET,Y ;DEFAULT
1688 STA PARMS,Y ;VALUES
1689 INY
1690 BNE CL2
1691 LDA #49
1692 JSR TOUT
1693 LDA #19
1694 JSR SCVTAB1
1695 LDA #54
1696 JSR TOUT
1697 JMP CPL1
1698
1699 CP LDY #>PARMS ;SET UP
1700 LDX #50 ;PARM
1701 CMP #0 ;BUFFER
1702 BEQ CS2 ;POINTRS
1703 LDY #>PREANLZ
1704 INX
1705 CMP #1
1706 BEQ CS2
1707 LDY #>CONTRLP
1708 INX
1709
1710 CS2 STY W2H ;SET UP
1711 LDY #0 ;PARM
1712 STY W2L ;SCREEN
1713 STY PARMNMBR
1714 TXA
1715 PHA
1716 LDA #C
1717 JSR SCVTAB1
1718 LDA #53
1719 JSR TOUT

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100000	20	15	720	LDA	#12	
100001	20	15	721	JSR	SCVTAB1	
100002	20	15	722	PLA		
100003	20	15	723	JSR	TOUT	
100004	20	15	724			
100005	20	15	725	LDA	#0	CHANGE
100006	20	15	726	STA	ZFLAG	ACTUAL
100007	20	15	727	BEQ	PS2	PARMS
100008	20	15	728	STA	PARMNMBR	MANAGER
100009	20	15	729	JSR	SCPMI	
100010	20	15	730	JSR	SCVLN	
100011	20	15	731	LDA	PARMNMBR	
100012	20	15	732	JSR	HDGET	
100013	20	15	733	BCC	PS1	
100014	20	15	734	JSR	CK3	
100015	20	15	735	BEQ	PS5	
100016	20	15	736	JSR	KYSUB2	
100017	20	15	737	CMP	#88	
100018	20	15	738	BNE	PS6	
100019	20	15	739	DEC	PARMNMBR	
100020	20	15	740	JMP	PS0	
100021	20	15	741	CMP	#8D	
100022	20	15	742	BNE	PS7	
100023	20	15	743	INC	PARMNMBR	
100024	20	15	744	JMP	PS0	
100025	20	15	745	CMP	#0	;QUIT
100026	20	15	746	BNE	PS0	
100027	20	15	747	JMP	CHNGPARM	
100028	20	15	748	INC	PARMNMBR	
100029	20	15	749	LDA	#0	
100030	20	15	750	STA	ZFLAG	
100031	20	15	751	BEQ	PS4	
100032	20	15	752	LDY	PARMNMBR	
100033	20	15	753	STA	(W2L),Y	
100034	20	15	754	JSR	SCPMN	
100035	20	15	755	JSR	SCVLI	
100036	20	15	756	LDY	PARMNMBR	
100037	20	15	757	LDA	(W2L),Y	
100038	20	15	758	JSR	HDGET	
100039	20	15	759	BCC	PS3	
100040	20	15	760	CMP	#A0	
100041	20	15	761	BEQ	PS9	
100042	20	15	762	CMP	#8D	
100043	20	15	763	BEQ	PS0	
100044	20	15	764	JMP	PS8	
100045	20	15	765			
100046	20	15	766	CMP	#A0	CHECK
100047	20	15	767	BEQ	CKD	FOR
100048	20	15	768	CMP	#:"	SPECIAL
100049	20	15	769	BEQ	CKD	KEYS
100050	20	15	770	CMP	#:"	
100051	20	15	771	BEQ	CKD	
100052	20	15	772	CMP	#="	
100053	20	15	773	BEQ	CKD	
100054	20	15	774	CMP	#-"	
100055	20	15	775	RTS		
100056	20	15	776			
100057	20	15	777	SCPMN		
100058	20	15	778	BEQ	#0	DISPLY
100059	20	15	779	SCPMI	SP2	CURRENT
100060	20	15	780	SP2	LDA	PARMNMBR
100061	20	15	781	LDY	#25	ON SCRIN
100062	20	15	782	BNE	SP1	
100063	20	15	783	SCVLN	LDA	
100064	20	15	784	BEQ	#0	
100065	20	15	785	SCVLI	SP3	
100066	20	15	786	LDY	PARMNMBR	
100067	20	15	787	LDA	(W2L),Y	
100068	20	15	788	LDY	#30	
100069	20	15	789	STY	SCHP	
100070	20	15	790	STX	IFLAG	
100071	20	15	791	PHA		
100072	20	15	792	LSRA		
100073	20	15	793	LSRA		
100074	20	15	794	LSRA		
100075	20	15	795	LSRA		
100076	20	15	796	JSR	HB	
100077	20	15	797	PLA		
100078	20	15	798	AND	#0F	
100079	20	15	799	CMP	#A	
100080	20	15	800	BCS	HBS2	
100081	20	15	801	LDX	IFLAG	
100082	20	15	802	BEQ	HBS1	
100083	20	15	803	ORA	#70	
100084	20	15	804	BNE	HBS4	
100085	20	15	805	ORA	#B0	

1803:	D0	0A		1806	BNE	HBS4	
1805:	18			1807	CLC		
1806:	AE	23	19	1808	LDX	I FLAG	
1809:	D0	02		1809	BNE	HBS3	
180B:	09	80		1810	ORA	#\$80	
180D:	69	37		1811	ADC	#\$37	
180F:	20	20	16	1812	JSR	COUT	
18E2:	60			1813	RTS		
18E3:	8D	22	19	1815	HDGET	STA	HBWRK
18E6:	20	28	0D	1816	JSR	KYGET	:GET A
18E9:	C9	B0		1817	CMP	#\$B0	:HEX
18EB:	90	2F		1818	BCC	NOTHEX	:DIGIT
18ED:	C9	BA		1819	CMP	#\$BA	
18EF:	90	0D		1820	BCC	HEXOK	
18F1:	C9	C1		1821	CMP	#\$C1	
18F3:	90	27		1822	BCC	NOTHEX	
18F5:	C9	C7		1823	CMP	#\$C7	
18F7:	80	23		1824	BCC	NOTHEX	
18F9:	38			1825	SEC		
18FA:	E9	B7		1826	SBC	#\$B7	
18FC:	D0	02		1827	BNE	HEXOK1	
18FE:	29	0F		1828	AND	#\$0F	
1900:	AE	24	19	1829	LDX	ZFLAG	
1903:	D0	04		1830	BNE	HEXOK2	
1905:	EE	22	19	1831	STX	HBWRK	
1908:	EE	24	19	1832	INC	ZFLAG	
190B:	0E	22	19	1833	ASL	HBWRK	
190E:	0E	22	19	1834	ASL	HBWRK	
1911:	0E	22	19	1835	ASL	HBWRK	
1914:	0E	22	19	1836	ASL	HBWRK	
1917:	0D	22	19	1837	ORA	HBWRK	
191A:	18			1838	CLC		
191B:	60			1839	RTS		
191C:	38			1840	SEC		
191D:	60			1841	RTS		
191E:	00			1842			
191F:	00			1843	RERCNTR	DFB	0
1920:	00			1844	WERCNTR	DFB	0
				1845	MJRERR	DFB	0
1921:	00			1846			
1922:	00			1847	PARMINMBR	DFB	0
1923:	00			1848	HBWRK	DFB	0
1924:	00			1849	I FLAG	DFB	0
1925:	00			1850	ZFLAG	DFB	0
				1851	DFSIGN	DFB	0
				1852			:INVRSE
				1853			:ZEROUT
				1854			:DIFFRNT
				1855			
				1856			
				1857	COPYDISK	LDA	#\$44
1926:	A9	2C		1858	JSR	TOUT	:BACK UP
1928:	20	05	15	1859	JSR	GETRKS	:A DISK
192B:	20	30	12	1860	CLC		:OPTION
192E:	18			1861	JSR	GETSYNC	:GET
1932:	20	23	13	1862	JSR	SCNV	:TRACKS,
1935:	20	4A	15	1863	JSR	GNC	:SYNC,
1938:	20	51	1A	1864	JSR	SCNV	:AND
193B:	20	4A	15	1865	LDA	#\$1	:NIBBLE
193D:	A9	DB		1866	JSR	COUT	:COUNT
1940:	20	20	16	1867	LDA	#0	:INPUTS
1942:	A9	00		1868	STA	TIMEFLG	:FROM
1945:	8D	8E	B2	1869	LDA	NBLCFLG	:USER
1948:	AD	8D	B2	1870	CMP	#1	
194A:	C9	01		1871	BEQ	CD3	
194C:	F0	08		1872	LDA	EDDVRSN	
194F:	AD	CA	B2	1873	BEQ	CD3	
1951:	F0	03		1874	JSR	GETTIME	
1954:	20	2C	13	1875	LDA	DRVCOUNT	
1957:	AD	85	B2	1876	BEQ	CD1	:INSERT
1959:	F0	08		1877	LDA	#46	:BOTH
195B:	A9	2E		1878	JSR	TOUT	:DISK???
195E:	20	05	15	1879	JSR	KYCLRGET	
1961:	20	22	0D	1880	LDA	STARTRK	
1964:	AD	88	B2	1881	STA	TRACK	
1967:	8D	88	B2	1882	LDA	DRVCOUNT	
196A:	AD	85	B2	1883	BNE	CD2	:INSERT
196C:	D0	08		1884	LDA	#47	:ORIGINAL
196E:	A9	2F		1885	JSR	TOUT	:DISK???
1971:	20	05	15	1886	JSR	KYCLRGET	
1974:	20	22	0D	1887	LDA	#0	:SET ORG
1976:	A9	CF		1888	JSR	SETDRV	:DRIVE
1979:	20	80		1889	LDA	RERRORS	
197C:	AD	19	B3	1890	STA	RERCNTR	:RESET
197F:	8D	1E	19	1891	LDA	#"	:ERRORS

1981: 8D	19	1989: 8D	19	STA	MJRERR	
1984: 20		1992: 8D		JSR	TRKR	; READ
1987: 20		1995: 8D		JSR	SCCOPY	
1990: 20		1998: 8D		LDA	DRVCOUNT	
1993: 20		2001: 8D		BNE	CD4	; INSRT
1996: 20		2004: 8D		LDA	#48	; DUPLCT
1999: 20		2007: 8D		JSR	TOUT	; DISK???
2002: 20	15	2005: 8D		JSR	KYCLRGET	
2004: 20	0D	2008: 8D		LDA	# "D"	
2007: 20		2011: 8D		JSR	SETDRV	
2010: 20	11	2014: 8D		JSR	TRKWV	
2017: 20	1A	2017: 8D		LDA	MJRERR	; DSPLY
2020: 20		2020: 8D		JSR	EPOUT	; ECODE
2023: 20		2023: 8D		JSR	NTRKCALC	
2026: 20		2026: 8D		STA	STARTRK	
2029: 20		2029: 8D		BCC	CD1	
2032: 20		2032: 8D		JMP	PDONE1	
1980: CE	1E	1991: 8D		DEC	RERCNTR	; READ
1983: 00		1994: 8D		BNE	TR4	; ERROR
1986: 8D		1997: 8D		LDA	# "R"	; CNTR
1989: 20		2000: 8D		STA	MJRERR	
1992: 20		2003: 8D		JMP	TR3	
1995: 20		2006: 8D		JSR	ERSBTM	; READ
1998: 20		2009: 8D		JSR	MTRON	; ORIGINAL
2001: 20		2012: 8D		JSR	WP1	; TRACK
2004: 20		2015: 8D		LDA	STARTRK	; MANAGER
2007: 20		2018: 8D		JSR	SYNCTRK2	
2010: 20		2021: 8D		LDA	#12	; DSPLY
2013: 20		2024: 8D		JSR	EPOUT	; INV-R
2016: 20		2027: 8D		LDA	TIMEFLG	
2019: 20		2030: 8D		BEQ	TR1	
2022: 20		2033: 8D		JSR	DCCDUMP	
2025: 20		2036: 8D		JMP	TR2	
2028: 20		2039: 8D		JSR	TDUMPW	; DUMP
2031: 20		2042: 8D		JSR	ANALYZE	; TRACK,
2034: 20		2045: 8D		BCS	TR5	; THEN
2037: 20		2048: 8D		LDA	TRKLL	; ANALYZE
2040: 20		2051: 8D		STY	TTLENL	; IF ERR
2043: 20		2054: 8D		STA	TTLENH	; THEN
2046: 20		2057: 8D		JSR	MTROFF	; REPEAT
2049: 20		2060: 8D		RTS		
19F4: CE	1F	1993: 8D		DEC	WERCNTR	; WRITE
19F7: 00		1996: 8D		BNE	TW2	; ERROR
19F9: 8D		1999: 8D		LDA	# "W"	; CNTR
19FB: 20		2002: 8D		STA	MJRERR	
19FE: 20		2005: 8D		JMP	TW0	
1A01: 20		2008: 8D		JSR	ERSBTM	; WRITE
1A04: 20		2011: 8D		JSR	MTRON	; TRACK
1A07: 20		2014: 8D		JSR	CHKWV	; MANAGER
1A0A: 20		2017: 8D		LDA	WERRORS	
1A0D: 20		2020: 8D		STA	WERCNTR	
1A10: 20		2023: 8D		LDA	STARTRK	
1A13: 20		2026: 8D		JSR	SYNCTRK2	
1A16: 20		2029: 8D		LDA	SYNCF LG	
1A19: 20		2032: 8D		BEQ	TW3	
1A1B: 20		2035: 8D		JSR	WSTSYNC	
1A1E: 20		2038: 8D		JSR	TRKWRT	; WRITE
1A21: 20		2041: 8D		LDA	MJRERR	; TRACK
1A24: 20		2044: 8D		CMR	# "R"	; THEN
1A26: 20		2047: 8D		BEQ	TW0	; VERIFY
1A28: 20		2050: 8D		LDA	#16	; TRACK
1A2A: 20		2053: 8D		JSR	EPOUT	; LENGTH
1A2D: 20		2056: 8D		JSR	CHKESC	; WITH
1A30: 20		2059: 8D		JSR	TDUMPV	; ORIGINAL
1A33: 20		2062: 8D		JSR	ENDLNGTH	; LENGTH
1A36: 20		2065: 8D		BCS	TW	
1A38: 20		2068: 8D		JSR	DSPLYDIF	
1A3B: 20		2071: 8D		BCC	TW0	
1A3D: 20		2074: 8D		LDA	NBL CFLG	; DO
1A40: 20		2077: 8D		BEQ	TW0	; NIBBLE
1A42: 20		2080: 8D		CMR	#2	; COUNT
1A44: 20		2083: 8D		BEQ	TW1	; IF
1A46: 20		2086: 8D		JSR	NCAUTO	; NEEDED
1A49: 20		2089: 8D		BCC	TW1	
1A4B: 20		2092: 8D		BCS	TWE	
1A4D: 20		2095: 8D		JSR	MTROFF	; TRACK
1A50: 80		2098: 8D		RTS		; DONE
1A51: A9	2B	2101: 8D		LDA	#43	; ASK
1A53: 20		2104: 8D		JSR	TOUT	; USER
1A56: 20		2107: 8D		JSR	SLV	; IF
1A59: 20		2110: 8D		JSR	RHTAB	; TRACKS



A5C:	A9	25	1978	LDA	#37	NEED	
A5E:	8D	B2	1979	STA	WS2	NIBBLE	
A61:	20	15	1980	JSR	TOUT	COUNT	
A64:	20	07	1981	JSR	RHTAB		
A67:	20	00	1982	JSR	KYPRMPT		
A6A:	C9	8D	1983	CMP	#8D		
A6C:	F0	1C	1984	BEQ	GNCS3		
A6E:	A0	25	1985	LDY	#37		
A70:	C9	CE	1986	CMP	#N	NO!	
A72:	F0	0A	1987	BEQ	GNCS2		
A74:	C8		1988	INY			
A75:	C9	C1	1989	CMP	#A	AUTO	
A77:	F0	05	1990	BEQ	GNCS2	COUNT	
A79:	C8		1991	INY			
A7A:	C9	CD	1992	CMP	#M	MANUAL	
A7C:	D0	E9	1993	BNE	GNCL1	NIBBLE	
A7E:	8C	98	1994	STY	WS2	COUNT	
A81:	98	B2	1995	TYA			
A82:	20	05	1996	JSR	TOUT		
A85:	A9	DB	1997	LDA	#I		
A87:	20	20	1998	JSR	COUT		
A8A:	AD	98	1999	LDA	WS2		
A8D:	A0	00	2000	LDY	#0		
A8F:	C9	25	2001	CMP	#37		
A91:	F0	04	2002	BEQ	GNCS4		
A93:	C8		2003	INY			
A94:	C9	26	2004	CMP	#38		
A96:	F0	01	2005	BEQ	GNCS4		
A98:	C8		2006	INY		0=NO	
A99:	8C	8D	2007	STY	NBLCFLG	1=AUTO	
A9C:	60	B2	2008	RTS		2=MANUL	
A9D:	A9	37	2009				
A9F:	20	05	2010	SCCOPY	LDA	#55	SCREEN
AA2:	AD	C1	2011	JSR	TOUT		DISPLY
AA5:	85	02	2012	LDA	TRKDSL		WHILE
AA7:	85	04	2013	STA	\$2		DISK
AA9:	AD	C2	2014	STA	\$4		BACK UP
AAC:	85	03	2015	LDA	TRKDSH		MANAGER
AAE:	AD	C3	2016	STA	\$3		
AB1:	85	05	2017	LDA	TRKTSH		
AB3:	20	83	2018	STA	\$5		
AB6:	20	83	2019	JSR	SCHBLN		DISPLY
AB9:	20	83	2020	JSR	SCHBLN		5 LINES
ABE:	20	83	2021	JSR	SCHBLN		OF
ABF:	20	83	2022	JSR	SCHBLN		START
AC2:	A9	38	2023	JSR	SCHBLN		TRACK
AC4:	20	05	2024	LDA	#56		
AC7:	A9	E8	2025	JSR	TOUT		
AC9:	85	04	2026	LDA	#E8		
ACB:	85	02	2027	STA	\$4		
ACD:	A9	93	2028	STA	\$2		
ACF:	85	03	2029	LDA	#93		
AD1:	A9	AF	2030	STA	\$3		DISPLY
AD3:	85	05	2031	LDA	#AF		2 LINES
AD5:	20	83	2032	STA	\$5		OF
AD8:	20	83	2033	JSR	SCHBLN		END
ADB:	A9	39	2034	JSR	SCHBLN		TRACK
ADD:	20	05	2035	LDA	#57		
AEO:	A9	14	2036	JSR	TOUT		
AEE:	20	53	2037	LDA	#20		
AEE:	A9	0C	2038	JSR	SCVTAB1		
AEE:	85	0B	2039	LDA	#12		DISPLY
AEE:	20	79	2040	STA	SCHP		TRACK
AEE:	A9	20	2041	JSR	TRKOUT1		NUMBER
AEE:	85	0B	2042	LDA	#32		
AEE:	A9	A4	2043	STA	SCHP		DISPLY
AEE:	20	20	2044	LDA	#"		ORIGINAL
AEE:	A0	00	2045	JSR	COUT		TRACK
AEE:	AD	C8	2046	LDY	#0		LENGTH
AEE:	20	C5	2047	LDA	TRKLH		
AEE:	AD	C7	2048	JSR	ZZ1		
AEE:	20	C5	2049	LDA	TRKLL		
AEE:	60	B2	2050	JSR	ZZ1		
AEE:			2051	RTS			
AEE:			2052				
BO4:	A9	15	2053	DSPLYDIF	LDA	#21	DISPLY
BO6:	20	53	2054	JSR	SCVTAB1		THE
BO9:	A9	20	2055	LDA	#32		DIFFRCE
BOB:	85	0B	2056	STA	SCHP		BETWEEN
BOB:	AD	AA	2057	LDA	ITLENH		ORIGINAL
BOB:	CD	C8	2058	CMP	TRKLH		AND
BOB:	90	25	2059	BCC	DLNGR		DUPLCT
BOB:	D0	41	2060	BNE	DLNGR		TRACK
BOB:	AD	A9	2061	LDA	TTLENL		LENGTHS
BOB:	CD	C7	2062	CMP	TRKLL		
BOB:	90	1B	2063	BCC	DLNGR		

1B1F:	D0	37	2064	BNE	OLNGR	
1B21:	A0		2065	LDA	#A0	
1B23:	8D	19	2066	STA	DFSIGN	
1B24:	20	16	2067	JSR	COUT	
1B29:	A9	30	2068	LDA	#30	: INV-0
1B2B:	20	16	2069	JSR	COUT	: (EQUAL)
1B2E:	A9	DB	2070	LDA	#"	
1B30:	20	16	2071	JSR	COUT	
1B33:	A9	AE	2072	LDA	#"	
1B35:	8D	19	2073	STA	MJRERR	: FORCE
1B38:	18		2074	CLC		: GOOD
1B39:	60		2075	RTS		: ERROR
1B3A:	A9	BE	2076	LDA	#">"	: DUPLCT
1B3C:	8D	19	2077	STA	DFSIGN	: IS MORE
1B3F:	20	16	2078	JSR	COUT	
1B42:	A9	AE	2079	LDA	#"	
1B44:	8D	19	2080	STA	MJRERR	: FORCE
1B47:	AD	C7	2081	LDA	TRKLL	: GOOD
1B4A:	38		2082	SEC		
1B4B:	ED	A9	2083	SBC	TTLENL	
1B4E:	A8		2084	TAY		
1B4F:	AD	C8	2085	LDA	TRKLH	
1B52:	ED	AA	2086	SBC	TTLENH	
1B55:	4C	73	2087	JMP	DDL2	
1B58:	A9	BC	2088	LDA	#"<"	: DUPLCT
1B5A:	8D	19	2089	STA	DFSIGN	: IS LESS
1B5D:	20	16	2090	JSR	COUT	
1B60:	A9	CC	2091	LDA	#"L"	: LENGTH
1B62:	8D	19	2092	STA	MJRERR	: ERROR
1B65:	AD	A9	2093	LDA	TTLENL	
1B68:	38		2094	SEC		
1B69:	ED	C7	2095	SBC	TRKLL	
1B6C:	A8		2096	TAY		
1B6D:	AD	AA	2097	LDA	TTLENH	
1B70:	ED	C8	2098	SBC	TRKLH	
1B73:	8C	9F	2099	STY	CNVHEX	
1B76:	8D	A0	2100	STA	CNVHEX+1	
1B79:	20	E3	2101	JSR	HOUT	
1B7C:	A9	DB	2102	LDA	#"	
1B7E:	20	16	2103	JSR	COUT	
1B81:	38		2104	SEC		
1B82:	60		2105	RTS		
1B83:	A9	0C	2106	LDA	#C	
1B85:	8D	98	2107	STA	WS2	: DISPLY
1B88:	A9	A0	2108	LDA	#"	: A LINE
1B8A:	20	16	2109	JSR	COUT	: OF
1B8D:	20	16	2110	JSR	COUT	: RAW
1B90:	A9	A0	2111	LDA	#"	: TRACK
1B92:	20	16	2112	JSR	COUT	: BYTES
1B95:	A0	00	2113	LDY	#0	
1B97:	B1	02	2114	LDA	(\$2),Y	
1B99:	48		2115	PHA		
1B9A:	C8		2116	INY		
1B9B:	B1	04	2117	LDA	(\$4),Y	
1B9D:	A8		2118	TAY		
1B9E:	A5	05	2119	LDA	\$5	
1BA0:	C9	AF	2120	CMP	#AF	
1BA2:	D0	08	2121	BNE	SCCS1	
1BA4:	A5	04	2122	LDA	\$4	
1BA6:	C9	FF	2123	CMP	#FF	
1BA8:	D0	02	2124	BNE	SCCS1	
1BAA:	A0	00	2125	LDY	#0	
1BAC:	68		2126	PLA		
1BAD:	20	C5	2127	JSR	ZZ1	
1BB0:	E6	02	2128	INC	\$2	
1BB2:	E6	04	2129	INC	\$4	
1BB4:	D0	04	2130	BNE	SCCL2	
1BB6:	E6	03	2131	INC	\$3	
1BB8:	E6	05	2132	INC	\$5	
1BBA:	CE	98	2133	DEC	WS2	
1BBD:	D0	D1	2134	BNE	SCCL1	
1BBF:	A9	00	2135	LDA	#"J"	
1BC1:	20	16	2136	JSR	COUT	
1BC4:	60		2137	RTS		
1BC5:	48		2138	PHA		: PROCESS
1BC6:	4A		2139	LSRA		: A RAW
1BC7:	4A		2140	LSRA		: DISK
1BC8:	4A		2141	LSRA		: BYTE
1BC9:	4A		2142	LSRA		: & THEN
1BCA:	C0	02	2143	CPY	#2	: DISPLY
1BCC:	20	D4	2144	JSR	Z1	: IT ON
1BCF:	68		2145	PLA		: SCREEN
1BD0:	29	0F	2146	AND	#0F	
1BD2:	C0	01	2147	CPY	#1	
			2148			
			2149			

1B04:	90	06	21	50	Z1	BCC	Z2	
1B06:	C9	0A	21	51		BCCM	##A	;INVRSE
1B08:	90	08	21	52		BCCM	Z3	
1B0A:	B0	0C	21	53		BCCM	Z4	
1B0C:	C9	0A	21	54	Z2	BCCM	##A	;NORMAL
1B0E:	B0	06	21	55		BCCM	Z5	
1B10:	09	80	21	56		ORA	##80	
1B12:	09	30	21	57	Z3	ORA	##30	
1B14:	00	05	21	58		BNE	Z6	
1B16:	09	C0	21	59	Z5	ORA	##C0	
1B18:	38		21	60	Z4	SEC		
1B19:	E9	09	21	61		SEC	#9	
1B1B:	20	20	21	62	Z6	JSR	COUT	
1B1E:	60		21	63		RTS		

--End assembly--

4079 bytes

Errors: 0

:ASM

```

1670 *-----
1671
1672 *****
1673 * ESSENTIAL DATA DUPLICATOR
1674 * VERSION 4.2 STANDARD/PLUS
1675 * 6502 ASSEMBLY SOURCE CODE
1676 * COPYRIGHT (C) 1986
1677 * ALL RIGHTS RESERVED
1678 * UTILICO MICROWARE
1679 * DONALD ANTHONY SCHNAPP
1680 * PRINTED APRIL 23, 1986
1681 *****
1682
1683 *****
1684 * OPTION 4 & 5 MODUAL *
1685 * $1D00-$1FFF *
1686 *****
1687
1688 FLAG DS $1D00-FLAG
1689
1000: 4C FD 1D 1690 CERTDISK JMP CDISK
1691
1692 *****
1693 * SCAN DISK OPTION *
1694 *****
1695
1696 SCANDISK LDA #28 : SCANDSK
1697 JSR TOUT : MANAGER
1698 JSR GETRKSAB
1699 CLC
1700 JSR GETSYNC : GET
1701 JSR GTDRVDQ2 : USER
1702 JSR MTRONCW : INFO &
1703 LDA #$40 : TURN
1704 STA $1 : MOTOR
1705 LDY #0 : ON
1706 STY $0
1707 TYA
1708 LDX #$20
1709 STA (<$0),Y : ERASE
1710 INY : HGR2
1711 BNE SCNL1 : & THEN
1712 INC $1 : TURN
1713 DEX : SCREEN
1714 BNE SCNL1 : ON
1715 BIT $C053
1716 BIT $C057
1717 BIT $C050
1718 LDA #20
1719 JSR SCVTAB1
1720 LDA #33
1721 JSR TOUT
1722 LDA #^
1723 JSR COUT
1724 LDA #1
1725 STA HGRVPOS
1726 LDA #2
1727 STA WZPAGE2 : SETUP
1728 JSR HRSCV : HGR
1729 LDY WZPAGE2 : SCREEN
1730 LDA LTSCPT,Y
1731 LDY #39
1732 HL1 STA (<$0),Y
1733 DEY
1734 CPY #3
1735 BNE HL1
1736 INC HGRVPOS
1737 DEC WZPAGE2
1738 BPL SCNL2
1739 LDA STARTRK
1740 JSR SYNCTRK2 : DUMP
1741 JSR TDUMPP : TRACK
1742 LDA #0 : FROM
1743 STA $2 : DISK
1744 LDA #$60
1745 STA $3
1746 LDA #5
1747 STA HGRVPOS
1748 JSR HRSCV
1749 JSR SCANBITS : ANALYZE
1750 BCC SCNS1 : AND
1751 JSR HRSDH : DISPLAY
1752 INC HGRVPOS : TRACK
1753 LDA HGRVPOS
1754 CMP #$9E
```

108C:	D0	EB		1755	BNE	SCNL4		
108E:	20	70	13	1756	JSR	NTRKCALC		
1091:	90	03		1757	BCC	SCNL3		
1093:	20	B3	15	1758	JSR	PDONE		
1096:	60			1759	RTS			
				1760				
1097:	A2	2D		1761	SCANBITS	LDX	#45	:ANALYZE
1099:	A0	00		1762		LDY	#0	:THE
109B:	8C	7F	1E	1763		STY	SYNC	:TIMING
109E:	B1	02		1764	SBL1	LDA	(#2),Y	:BITS
10A0:	30	03		1765		BMI	SBS1	:IN
10A2:	EE	7F	1E	1766		INC	SYNC	:BUFFER
10A5:	EE	02		1767	SBS1	INC	#2	
10A7:	D0	02		1768		BNE	SBS2	
10A9:	E6	03		1769		INC	#3	
10AB:	CA			1770	SBS2	DEX		
10AC:	D0	F0		1771		BNE	SBL1	
10AE:	AD	7F	1E	1772		LDA	SYNC	
10B1:	C9	02		1773		CMP	#2	
10B3:	60			1774		RTS		
				1775				
10B4:	AD	80	1E	1776	HRSCV	LDA	HGRVPOS	:CALC
10B7:	29	07		1777		AND	#07	:HGR_POS
10B9:	0A			1778		ASLA		:VERTCL
10BA:	0A			1779		ASLA		
10BB:	85	0E		1780		STA	WZPAGE1	
10BD:	AD	80	1E	1781		LDA	HGRVPOS	
10C0:	29	F8		1782		AND	#F8	
10C2:	4A			1783		LSRA		
10C3:	4A			1784		LSRA		
10C4:	A8			1785		TAY		
10C5:	B9	4C	1E	1786		LDA	LTVHRS,Y	
10C8:	85	00		1787		STA	#0	
10CA:	B9	4D	1E	1788		LDA	LTVHRS+1,Y	
10CD:	38			1789		SEC		
10CE:	E5	0E		1790		SBC	WZPAGE1	
10D0:	85	01		1791		STA	#1	
10D2:	60			1792		RTS		
				1793				
10D3:	A5	12		1794	HRSDH	LDA	CTRK	:DISPLAY
10D5:	C9	8D		1795		CMP	#8D	:RESULTS
10D7:	90	02		1796		BCC	HRSDHS	:FROM
10D9:	E9	8C		1797		BCC	#8C	:SCAN...
10DB:	4A			1798	HRSDHS	LSRA		:IF A
10DD:	4A			1799		LSRA		:TIMING
10DE:	18			1800		CLC		:BIT IS
10DF:	69	04		1801		ADC	#4	:PRESENT
10E0:	65	00		1802		ADC	#0	:THEN
10E2:	85	00		1803		STA	#0	:TURN ON
10E4:	A5	12		1804		LDA	CTRK	:THAT
10E6:	29	03		1805		AND	#03	:BIT ON
10E8:	0A			1806		ASLA		:SCREEN
10EA:	AA			1807		TAX		
10EC:	A0	00		1808		LDY	#0	
10ED:	B0	74	1E	1809		LDA	LTHHRS,X	
10EF:	11	00		1810		ORA	(#0),Y	
10F1:	91	00		1811		STA	(#0),Y	
10F3:	C8			1812		INY		
10F4:	E8			1813		INX		
10F5:	BD	74	1E	1814		LDA	LTHHRS,X	
10F8:	11	00		1815		ORA	(#0),Y	
10FA:	91	00		1816		STA	(#0),Y	
10FC:	60			1817		RTS		
				1818				
				1819				
				1820				
				1821				
				1822				
				1823				
10FD:	A9	28		1824	CDISK	LDA	#40	:CERTIFY
10FF:	20	FF	14	1825		JSR	TOUT	:AND
1E02:	20	26	12	1826		JSR	GETRKSAM	:ERASE
1E05:	20	84	11	1827		JSR	BLNKIND	:DISK
1E08:	20	78	17	1828		JSR	MTRON	:MANAGER
1E0B:	20	6D	15	1829		JSR	SETBS	
1E0E:	AD	88	B2	1830		LDA	STARTRK	
1E11:	20	06	B7	1831		JSR	ARMV	
1E14:	20	CC	16	1832		JSR	TRKWRT	
1E17:	20	07	16	1833		JSR	ERSBTM	
1E1A:	A9	00		1834		LDA	#0	:SETUP
1E1C:	8D	96	B2	1835		STA	FLG	:FLAG
1E1F:	AD	88	B2	1836		LDA	STARTRK	
1E22:	20	06	B7	1837	CEL1	JSR	ARMV	
1E25:	20	CC	16	1838		JSR	TRKWRT	
1E28:	20	0F	B7	1839		JSR	TRKV1	
1E2B:	A9	AE		1840		LDA	#"	:IF ERR
1E2D:	90	05				BCC	CES1	:THEN

\*\*\*\*\*  
 \* CERTIFY & ERASE DISK OPTION \*  
 \*\*\*\*\*

```

1E2F: A9 08 1841 LDA #*X" UNSET
1E31: 80 96 B2 1842 STA FLG FLAG
1E34: 20 2F 14 1843 CES1 JSR EPOUT
1E37: 70 70 13 1844 JSR NTRKCALC
1E3A: 90 E4 1845 BCC CEL1
1E3C: A0 29 1846 LDY #41
1E3E: AD 96 B2 1847 LDA FLG
1E41: F0 01 1848 BEQ CES2
1E43: C8 1849 INY
1E44: 98 1850 CES2 TYA
1E45: 20 FF 14 1851 JSR TOUT
1E48: 20 B3 15 1852 JSR PDONE
1E4B: 60 1853 RTS
1854
1855 *-----*
1856 * HGR2 BASE ADDRESS TABLE *
1857 *-----*
1858 LTVHRS DA $50D0
1859 DA $5D50
1860 DA $5CD0
1861 DA $5C50
1862 DA $5FA8
1863 DA $5F28
1864 DA $5FA8
1865 DA $5F28
1866 DA $5FA8
1867 DA $5F28
1868 DA $5CA8
1869 DA $5C28
1870 DA $5F80
1871 DA $5F00
1872 DA $5FE80
1873 DA $5FE00
1874 DA $5D80
1875 DA $5D00
1876 DA $5C80
1877 DA $5C00
1878
1879 *-----*
1880 * HIRES TABLE FOR BIT POSITION *
1881 *-----*
1882 LTHHRS DFB $18,$00 .00
1883 DFB $20,$00 .25
1884 DFB $00,$01 .50
1885 DFB $00,$04 .75
1886
1887 *-----*
1888 * HIRES PATTERN/BOTTOM SCREEN *
1889 *-----*
1E7C: 18 18 3C 1890 LTSCPT DFB $18,$18,$3C
1E7F: 00 1891
1E80: 00 1892 SYNC DFB 0
1893 HGRVPOS DFB 0

```

--End assembly--

4737 bytes

Errors: 0



```

620 *-----
621 *****
622 *****
623 * ESSENTIAL DATA DUPLICATOR
624 * VERSION 4.2 STANDARD/PLUS
625 * 6502 ASSEMBLY SOURCE CODE
626 * COPYRIGHT (C) 1986
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628 * UTILICO MICROWARE
629 * DONALD ANTHONY SCHNAPP
630 * PRINTED APRIL 23, 1986
631 *****
632 *****
633 *****
634 * OPTION 3 & 7 MODUAL *
635 * $2100-$24FF *
636 *****
637
638 FLAG DS $2100-FLAG
639
2100: 4C 32 21 640 DRVEXAM JMP DEXAM
641
642 *****
643 * DRIVE SPEED OPTION *
644 *****
645
2103: 20 0C 1F 646 DRVSPEED JSR CHECKMEM ;MANAGER
2106: A9 12 647 LDA #18 ;DRIVE
2108: 20 FF 14 648 JSR TOUT ;SPEED
210B: 20 70 11 649 JSR GTDRVD01 ;OPTION
210E: 20 9E 17 650 JSR MTROND
2111: A9 16 651 LDA #22
2113: 20 4D 15 652 JSR SCVTAB1
2116: 20 07 12 653 JSR SCDIND02
2119: A9 13 654 LDA #19
211B: 20 FF 14 655 JSR TOUT
211E: A0 04 656 LDY #4 ;SET
2120: 8C 7F B2 657 STY SPDLPNTR ;BUFFER,
2123: 20 6D 15 658 JSR SETBS ;CHECK
2126: 20 86 23 659 DRL1 JSR CHKSPD ;SPEED
2129: 20 AD 23 660 JSR SPDLINE ;THEN
212C: 20 72 0D 661 JSR KYDN1 ;DISPLAY
212F: 4C 26 21 662 JMP DRL1 ;SPEED
663
664 *****
665 * EXAMINE DRIVE OPTION *
666 *****
667
2132: 20 0C 1F 668 DEXAM JSR CHECKMEM ;MANAGER
2135: A9 15 669 LDA #21 ;EXAMINE
2137: 20 FF 14 670 JSR TOUT ;DRIVE
213A: 20 70 11 671 JSR GTDRVD01 ;OPTION
213D: 20 78 17 672 JSR MTRON
2140: A9 00 673 LDA #0
2142: 20 04 B7 674 JSR ARMV
2145: A9 16 675 LDA #22
2147: 20 FF 14 676 JSR TOUT
214A: 20 07 12 677 JSR SCDIND02
214D: A9 17 678 LDA #23
214F: 20 FF 14 679 JSR TOUT
2152: 20 AF 10 680 JSR SSRCH ;R/W
2155: 20 15 23 681 JSR EXROWT ;ABILITY
2158: 20 C3 0D 682 JSR CHKESC
215B: 20 D0 10 683 JSR SSFNLN ;AVERAGE
215E: 20 6D 15 684 JSR SETBS ;FLUCTN
2161: 20 45 2D 685 JSR EXMSPD ;SPEED
2164: 20 C3 0D 686 JSR CHKESC
2167: 20 D0 10 687 JSR SSFNLN ;COUNT
216A: 20 18 24 688 JSR SETBS ;HIGH
216D: 20 A1 21 689 JSR CTRKS ;TRACKS
2170: 20 C3 0D 690 JSR CHKESC
2173: 20 D0 10 691 JSR SSFNLN ;BLEED
2176: 20 B9 21 692 JSR BDOVR ;OVER
2179: 20 C3 0D 693 JSR CHKESC
217C: 20 D0 10 694 JSR SSFNLN ;SPEED
217F: 20 8B 21 695 JSR SPDARM ;OF ARM
2182: A9 19 696 LDA #25
2184: 20 FF 14 697 JSR TOUT
2187: 20 B3 15 698 JSR PDONE
218A: 60 699 RTS
670
218B: A9 00 671 SPDARM LDA #0 ;FIND
218D: 20 2C 22 672 JSR CTRKW ;THE
2190: A9 88 673 LDA #88 ;SPEED
2192: 20 2C 22 674 JSR CTRKW ;OF
2195: A9 00 675 LDA #0 ;ARM

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2197:	20	06	B7	1756	JSR	ARMV	:THEN
219A:	20	18	B7	1757	JSR	ARMSPD	:DISPLAY
219D:	20	07	14	1758	JSR	HXAOUT	
21A0:	60			1759	RTS		
21A1:	A9	88		1760			
21A3:	A0	04		1761	CTRKS	LDA	#\$88
21A5:	20	EB	21	1762		LDY	#4
21A8:	A5	0E		1763		JSR	CTRKDO
21AA:	C9	FF		1764		LDA	WZPAGE1
21AC:	F0	05		1765		CMP	#\$FF
21AE:	A0	02		1766		BEG	CTS3
21B0:	20	EB	21	1767		LDY	#2
21B3:	A5	0E		1768		JSR	CTRKDO
21B5:	20	76	14	1769	CTS3	LDA	WZPAGE1
21B8:	60			1770		JSR	TRKOUT2
				1771	RTS		
21B9:	A9	00		1772			
21BB:	20	06	B7	1773	BLDOVR	LDA	#0
21BE:	20	2F	22	1774		JSR	ARMV
21C1:	A9	01		1775		JSR	CTRKW2
21C3:	A0	00		1776		LDA	#1
21C5:	84	0F		1777		LDY	#0
21C7:	20	13	22	1778		STY	WZPAGE2
21CA:	A9	02		1779		JSR	VTRK
21CC:	20	2C	22	1780		LDA	#2
21CF:	A9	01		1781		JSR	CTRKW
21D1:	A0	02		1782		LDA	#1
21D3:	20	13	22	1783		LDY	#2
21D6:	20	2F	22	1784		JSR	VTRK
21D9:	A9	02		1785		JSR	CTRKW2
21DB:	A0	01		1786		LDA	#2
21DD:	20	13	22	1787		LDY	#1
21E0:	A9	00		1788		JSR	VTRK
21E2:	20	15	22	1789		LDA	#0
21E5:	A5	0F		1790		JSR	VTRK2
21E7:	20	57	23	1791		LDA	WZPAGE2
21EA:	60			1792		JSR	DCPOUT
				1793	RTS		
21EB:	84	0F		1794			
21ED:	20	2C	22	1795	CTRKDO	STY	WZPAGE2
21F0:	A5	12		1796	CTL1	JSR	CTRKW
21F2:	38			1797		LDA	CTRK
21F3:	E9	04		1798		SEC	
21F5:	20	2C	22	1799		SBC	#4
21F8:	A5	12		1800		JSR	CTRKW
21FA:	18			1801		LDA	CTRK
21FB:	69	04		1802		CLC	
21FD:	20	06	B7	1803		ADC	#4
2200:	20	12	B7	1804		JSR	ARMV
2203:	C5	12		1805		JSR	TRKV2
2205:	D0	0B		1806		CMP	CTRK
2207:	85	0E		1807		BNE	CD1
2209:	18			1808		STA	WZPAGE1
220A:	65	0F		1809		CLC	
220C:	90	DF		1810		ADC	WZPAGE2
220E:	A9	FF		1811		BCC	CTL1
2210:	85	0E		1812		LDA	#\$FF
2212:	60			1813		STA	WZPAGE1
				1814	CD1	RTS	
2213:	84	0E		1815			
2215:	20	06	B7	1816	VTRK	STY	WZPAGE1
2218:	20	12	B7	1817	VTRK2	JSR	ARMV
221B:	B0	0B		1818	VTRK3	JSR	TRKV2
221D:	C5	0E		1819		BCS	VD2
221F:	D0	07		1820		CMP	WZPAGE1
2221:	A9	19		1821		BNE	VD2
2223:	18			1822	VD1	LDA	#25
2224:	65	0F		1823		CLC	
2226:	85	0F		1824		ADC	WZPAGE2
2228:	20	2B	14	1825		STA	WZPAGE2
222B:	60			1826	VD2	JSR	EPBOUT
				1827		RTS	
222C:	20	06	B7	1828			
222F:	A5	12		1829	CTRKW	JSR	ARMV
2231:	4A			1830	CTRKW2	LDA	CTRK
2232:	09	AA		1831		LSRA	
2234:	8D	02	83	1832		ORA	#\$AA
2237:	A5	12		1833		STA	\$8302
2239:	09	AA		1834		LDA	CTRK
223B:	8D	03	83	1835		ORA	#\$AA
223E:	20	CC	16	1836		STA	\$8303
2241:	20	2B	14	1837		JSR	TRKWRT
2244:	60			1838		JSR	EPBOUT
				1839	RTS		
2245:	A9	00		1840			
				1841	EXMSPD	LDA	#0
							:EXAMINE

2247:	A0	07	1842	LDY	#7	DRIVE
2249:	99	15	1843	STA	HXF,Y	SPEED
224C:	88		1844	DEY		TO GET
224D:	10	FA	1845	BPL	EXL1	AVERAGE
224F:	84	10	1846	STY	LHXH	AND
2251:	A9	10	1847	LDA	#16	FLUCT
2253:	8D	97	1848	STA	WRKPNTR2	THEN
2256:	20	86	1849	JSR	CHKSPD	DISPLAY
2259:	20	28	1850	JSR	EPBOUT	BOTH
225C:	A0	A4	1851	LDA	CNVDEC+3	
225F:	29	0F	1852	AND	#0F	
2261:	85	0E	1853	STA	WZPAGE1	
2263:	20	9D	1854	JSR	CALCFLUC	
2266:	CE	97	1855	DEC	WRKPNTR2	
2269:	00	EB	1856	BNE	EXL2	
226B:	A9	00	1857	LDA	#0	
226D:	85	15	1858	STA	HXF	
226F:	A0	04	1859	LDY	#4	
2271:	46	17	1860	LSR	HXH	
2273:	66	16	1861	ROR	HXL	
2275:	66	15	1862	ROR	HXF	
2277:	00		1863	DEY		
2279:	00	F7	1864	BNE	EXL3	
227A:	20	62	1865	JSR	SPDOUTFH	
227D:	20	D0	1866	JSR	SSFNLN	
2280:	A5	18	1867	LDA	HDCF	
2282:	38		1868	SEC		
2285:	FE	18	1869	SBC	LDCF	
2288:	BD	04	1870	BCS	EXS1	
228A:	38		1871	SEC		
228C:	FE	9C	1872	SBC	#156	
228E:	11		1873	CLC		
2290:	85	14	1874	STA	DCF	
2293:	A9	19	1875	LDA	HXL	
2296:	1C		1876	SBC	LHXL	
2299:	85	16	1877	STA	HXL	
229B:	A9	1A	1878	LDA	HXXH	
229D:	1D		1879	SBC	LHXH	
229F:	85	17	1880	STA	HXH	
22A0:	20	71	1881	JSR	SPDOUTFD	
22A3:	60		1882	RTS		
22A6:			1883			
22A9:	20	C3	1884	JSR	CHKESC	ACTUAL
22AB:	A0	9A	1885	LDA	WSH2	CALC
22AD:	C5	1A	1886	CMP	HXXH	FLUCT
22AF:	90	21	1887	BCC	CAS2	ROUTINE
22B1:	D0	10	1888	BNE	CAS1	
22B3:	A0	99	1889	LDA	WSL2	
22B6:	C5	19	1890	CMP	HXL	
22B9:	90	18	1891	BCC	CAS2	
22BB:	D0	07	1892	BNE	CAS1	
22BD:	A0	9F	1893	LDA	CNVHEX	
22BF:	C5	18	1894	CMP	HDCF	
22C1:	90	0F	1895	BCC	CAS2	
22C3:	A0	9A	1896	LDA	WSH2	
22C6:	85	1A	1897	STA	HXXH	
22C9:	A0	99	1898	LDA	WSL2	
22CB:	85	19	1899	STA	HXL	
22CD:	A0	9F	1900	LDA	CNVHEX	
22CF:	85	18	1901	STA	HDCF	
22D1:	A0	9A	1902	LDA	WSH2	
22D4:	C5	1D	1903	CMP	LHXH	
22D7:	D0	12	1904	BCC	CAS3	
22D9:	A0	99	1905	BNE	CAS4	
22DB:	C5	1C	1906	LDA	WSL2	
22DE:	90	09	1907	CMP	LHXL	
22E0:	D0	16	1908	BCC	CAS3	
22E3:	A0	9F	1909	BNE	CAS4	
22E6:	C5	1B	1910	LDA	CNVHEX	
22E9:	80	0F	1911	CMP	LDCF	
22EB:	A0	9A	1912	BCS	CAS4	
22ED:	85	1D	1913	LDA	WSH2	
22EF:	A0	99	1914	STA	LHXH	
22F1:	85	1C	1915	LDA	WSL2	
22F4:	A0	9F	1916	STA	LHXL	
22F7:	85	1B	1917	LDA	CNVHEX	
22FA:	A5	0E	1918	STA	LDCF	
22FC:	18		1919	LDA	WZPAGE1	
22FE:			1920	CLC		
22FF:			1921	SED		
2300:			1922	ADC	HXF	
2301:			1923	CLD		
2302:			1924	CMP	#10	
2303:			1925	BCC	CAS5	
2304:			1926	AND	#0F	
2305:			1927	CLC		

22FF	FE	16	1928		INC	HXL	
2300	00		1929		BNE	CAS5	
2301	00		1930		INC	HXL	
2302	00		1931	CAS5	STA	HXF	
2303	00	B2	1932		LDA	WSL2	
2304	00		1933		ADC	HXL	
2305	00	B2	1934		STA	HXL	
2306	00		1935		LDA	WSH2	
2307	00		1936		ADC	HXL	
2308	00		1937		STA	HXL	
2309	00		1938		RTS		
2310	00		1939				
2311	00		1940	EXRDWT	LDA	#0	CHECK
2312	00	B2	1941		STA	WRKPNTR	READ
2313	00		1942		STA	WZPAGE2	WRITE
2314	00		1943		JMP	EXS2	ABILITY
2315	00		1944	EXL4	JSR	TRKWRT	THEN
2316	00	B7	1945		JSR	TRKV1	DISPLAY
2317	00	B14	1946		JSR	EPBOUT	RESULTS
2318	00		1947		BCC	EXS3	
2319	00	B2	1948		LDY	WRKPNTR	
2320	00	B2	1949		LDA	LTEA,Y	
2321	00		1950		ADC	WZPAGE2	
2322	00		1951		STA	WZPAGE2	
2323	00	B2	1952	EXS2	INC	WRKPNTR	
2324	00	B2	1953		LDA	#3	
2325	00	B24	1954		STA	WRKPNTR2	
2326	00		1955		JSR	SETBDEX	
2327	00		1956		BEQ	DCPOUT	
2328	00	B7	1957	EXL5	JSR	TRKWRT	
2329	00	B14	1958		JSR	TRKV1	
2330	00		1959		JSR	EPBOUT	
2331	00		1960	EXS3	BCC	EXL4	
2332	00		1961		LDA	WZPAGE2	
2333	00		1962		BEQ	DCPOUT	
2334	00	B2	1963		DEC	WZPAGE2	
2335	00		1964		DEC	WRKPNTR2	
2336	00		1965		BNE	EXL5	
2337	00		1966	DCPOUT	LDA	WZPAGE2	
2338	00	B14	1967		JSR	HAOUT	
2339	00		1968		LDA	#"/"	
2340	00	B16	1969		JSR	COUT	
2341	00		1970		RTS		
2342	00		1971				
2343	00	F8	1972	SPDOUTFH	JSR	SHTAB	DISPLAY
2344	00	A4	1973		JSR	NMBFOUT2	HEX
2345	00	A9	1974	SPL1	LDA	#20	NUMBER
2346	00	FF	1975		JSR	TOUT	& FRCTN
2347	00	01	1976		JSR	RHTAB	THEN
2348	00		1977		RTS		"RPM"
2349	00		1978				
2350	00		1979				
2351	00	F8	1980	SPDOUTFD	JSR	SHTAB	DISPLAY
2352	00	A5	1981		LDA	HXL	DECIMAL
2353	00	A6	1982		LDX	HXL	NUMBER
2354	00	D7	1983		JSR	HXAOUT	& FRCTN
2355	00	A5	1984		LDA	DCF	THEN
2356	00	0E	1985		JSR	CNVHAD	"RPM"
2357	00	C3	1986		JSR	TNTHSOUT	
2358	00	4C	1987		JMP	SPL1	
2359	00		1988				
2360	00	CC	1989	CHKSPD	JSR	TRKWRT	CHECK
2361	00	A0	1990		JSR	TRKDS	DRIVE
2362	00	24	1991		JSR	CALCRPM	SPEED
2363	00	9F	1992		LDA	CNVHEX	DRIVER
2364	00	99	1993		STA	WSL2	
2365	00		1994		SEC		
2366	00	26	1995		SBC	#26	
2367	00	A7	1996		STA	TEMP1	
2368	00	A0	1997		LDA	CNVHEX+1	
2369	00	9A	1998		STA	WSH2	
2370	00	01	1999		SBC	#01	
2371	00	A8	2000		STA	TEMPH	
2372	00	92	2001		JSR	RPMOUT	
2373	00	2B	2002		JSR	EPBOUT	
2374	00		2003		RTS		
2375	00		2004				
2376	00		2005	SPDLIN	LDY	SPDLPNTR	DISPLAY
2377	00	B2	2006		LDA	#"-"	DRIVE
2378	00	0A	2007		STA	\$AA8,Y	SPEED
2379	00		2008		LDA	#25	IN A
2380	00		2009		LDX	#0	"LINE"
2381	00	B2	2010		LDY	TEMPF	FORMAT
2382	00		2011		STY	\$0	
2383	00	0E	2012		JSR	DIVDAXY	
2384	00	A6	2013		STA	TEMPF	
2385	00	B2			LDA	TEMPH	

23C7:	30	2E	2014	BMI	SPS2	
23C9:	00	30	2015	BNE	SPS3	
23CB:	A0	A7 B2	2016	LDA	TEMPL	
23CD:	00		2017	ASLA		
23CE:	00		2018	ASLA		
23D0:	18		2019	CLC		
23D1:	A6	B2	2020	ADC	TEMPF	
23D4:	04		2021	TAY		
23D5:	04		2022	LDA	W3L	
23D7:	00		2023	CMP	#12	
23D9:	01		2024	BCC	SPS1	
23DB:	00		2025	INY		
23DD:	00		2026	INY		
23DE:	04		2027	CPY	#4	
23DF:	16		2028	BCC	SPS2	
23E0:	22		2029	CPY	#34	
23E1:	16		2030	BCS	SPS3	
23E3:	28	0B	2031	LDA	\$B28,Y	
23E4:	A0		2032	CMP	#\$A0	
23E6:	02		2033	BNE	SPL3	
23E9:	A0		2034	LDA	#"-"	
23EA:	49		2035	EDR	#\$80	
23EB:	A8	0A	2036	STA	\$\$\$A8,Y	
23EC:	7F	B2	2037	STY	SPDLPNTR	
23ED:	60		2038	RTS		
23F7:	A0	04	2039	LDY	#4	
23F9:	D0	EA	2040	BNE	SPL2	
23FB:	A0	22	2041	LDY	#34	
23FD:	D0	E6	2042	BNE	SPL2	
23FF:	60		2043	RTS		
2400:	A0	03	2044			
2402:	B9	61 B2	2045	CALCRPM	LDY	#3
2405:	99	02 00	2046	CAL1	LDA	LTDV,Y
2408:	88		2047		STA	W2L,Y
2409:	10	F7	2048		DEY	
240B:	20	FA 0E	2049		BPL	CAL1
240E:	8D	9F B2	2050		JSR	DIVIDE
2411:	8A		2051		STA	CNVHEX
2412:	29	01	2052		TXA	
2414:	8D	A0 B2	2053		AND	#\$01
2417:	60		2054		STA	CNVHEX+1
			2055		RTS	
2418:	A9	FF	2056			
241A:	A0	01	2057	SETBE	LDA	#\$FF
241C:	20	7D 15	2058		LDY	#1
241F:	A9	D5	2059		JSR	SETBV
2421:	80	00 83	2060		LDA	#\$05
2424:	A9	96	2061		STA	\$8300
2426:	80	01 83	2062		LDA	#\$96
2429:	60		2063		STA	\$8301
			2064		RTS	
			2065			
242A:	AC	92 B2	2066	SETBDEX	LDY	WRKPNTR
242D:	B9	48 B2	2067		LDA	LTEX,Y
2430:	A0	00	2068		LDY	#0
2432:	20	7D 15	2069		JSR	SETBV
2435:	48		2070		PHA	
2436:	48		2071		PLA	
2437:	60		2072		RTS	

--End assembly--

6200 bytes

Errors: 0



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199 *****
200 * ESSENTIAL DATA DUPLICATOR
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206 * DONALD ANTHONY SCHNAPP
207 * PRINTED APRIL 23, 1986
208 *****
209
210 *****
211 * ANALYZE ROUTINES *
212 *****
213
214 ORG ANALYZE
215
216 JMP ANALYZET
217 JMP FNDLNTH
218 JMP WSTSYNC ;WAIST
219 JMP NCAUTO ;NBLCNT
220
221 WSTSYNC LDA WSYNCL ;WAIST
222 STA $2 ;TIME
223 LDA WSYNCH ;FOR
224 STA $3 ;SYNCRNZ
225 WSTL1 PHA ;TRACK
226 PLA
227 LDA $2
228 NOP
229 WSTL2 LDA $2
230 LDA $C0EC
231 DEC $2
232 LDA $2
233 CMP #$FF
234 BNE WSTL1
235 DEC $3
236 LDA $3
237 CMP #$FF
238 BNE WSTL2
239 RTS
240
241 ANALYZET JSR CHKESC ;ANALYZE
242 LDA #0 ;TRACK
243 STA TRKDSL ;MANAGER
244 STA TRKDSH
245 STA TRKTSH ;SETUP
246 STA TRKDEL ;WORK
247 STA TRKDEH ;SPACE
248 STA TRKTEH
249 STA TRKLL
250 STA TRKLH
251 STA $FF
252 LDA #$50
253 JSR EPOUT ;DO
254 LDA #0 ;PREANLZ
255 JSR CONTROL ;ROUTINE
256 LDA #$01
257 JSR EPOUT ;DO TRK
258 JSR TRKE ;END
259 BCS ERRRE
260 JSR TRKL ;DO TRK
261 BCS ERRRL ;LENGTH
262 LDA TRKLH
263 CMP MAXLNTH
264 BCS ERRRL
265 CMP MINLNTH
266 BCC ERRRL
267 ANLZ2 LDY TRKLL
268 LDX TRKLH
269 LDA SPCLCNTL ;PARM#0A
270 AND #$80
271 BEQ ANLZ4
272 LDA TRKDEL
273 SEC
274 SBC #$80
275 TAY
276 LDA TRKDEH
277 SBC #$40
278 TAX
279 CPX #$1C
280 BCC ANLZ4
281 LDY #$FF
282 LDX #$1B
283 ANLZ4 STY TLENL ;KEEP
284 STX TLENH ;TRACK

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269E:	AD	8C	B2	285	LDA	SYNCFG	:OF TRK
26A1:	FD	09		286	BEQ	ANLZ3	:LENGTH
26A3:	20	9F	2B	287	JSR	CALCSYN	
26A6:	A9	43		288	LDA	#\$43	
26A8:	20	12	0C	289	JSR	EPOUT	:DO
26AB:	A9	01		290	LDA	#1	:PREWIT
26AD:	20	2A	2C	291	JSR	CONTROL	:ROUTINE
26B0:	A9	20		292	LDA	#\$20	
26B2:	20	12	0C	293	JSR	EPOUT	
26B5:	20	8D	2A	294	JSR	MOVEBUF	
26B8:	20	B5	27	295	JSR	TRKS	:CALC
26BC:	18			296	CLC		:TRACK
	60			297	RTS		:START
				298			
26BD:	A0	5E		299	LDY	#\$5E	:END
26BF:	8C	C5	B2	300	STY	TRKDEH	:ERROR
26C2:	A0	96		301	LDY	#\$96	:MANAGER
26C4:	8C	C6	B2	302	STY	TRKTEH	
26C7:	A0	00		303	LDY	#0	
26C9:	8C	C4	B2	304	STY	TRKDEL	
26CC:	85	FF		305	STA	\$\$\$	:LENGTH
26CE:	A0	FF		306	LDY	\$\$\$	:ERROR
26D0:	8C	C7	B2	307	STY	TRKLL	:MANAGER
26D3:	A0	1B		308	LDY	\$\$\$1B	
26D5:	A0	C5	B2	309	LDA	TRKDEH	
26D8:	38			310	SEC		
26DA:	F9	40		311	SBC	#\$40	
26DB:	CC	1C		312	CMP	#\$1C	
26DD:	B0	07		313	BCS	ESKP1	
26DF:	AC	C4	B2	314	LDY	TRKDEL	
26E2:	8C	C7	B2	315	STY	TRKLL	
26E5:	A0			316	TAY		
26E6:	8C	C8	B2	317	STY	TRKLH	
26E9:	20	76	26	318	JSR	ANLZ2	
26FC:	38			319	SEC		
26FD:	60			320	RTS		
				321			
26FE:	A0	00		322	LDY	#0	:VERIFY
26FF:	A9	42		323	LDA	#\$42	:DISK
2702:	20	0E	2A	324	JSR	CSAME	:MANAGER
2705:	B0	FF		325	BCS	CSERRF	
2707:	00	F3		326	BNE	CSERRF	
2709:	84	00		327	STY	#0	
270B:	18			328	CLC		
270D:	6D	C7	B2	329	ADC	TRKLL	
270F:	85	06		330	STA	\$6	
2711:	A9	42		331	LDA	#\$42	
2713:	69	00		332	ADC	#0	
2715:	38			333	SEC		
2717:	F9	02		334	SBC	#2	
2719:	18			335	CLC		
271B:	6D	C8	B2	336	ADC	TRKLH	
271D:	85	07		337	STA	\$7	
271F:	A9	00		338	LDA	#0	
2721:	8D	0B	2C	339	STA	TSTLL	
2723:	8D	0C	2C	340	STA	TSTLH	
2725:	A9	0A		341	LDA	#10	
2727:	85	08		342	STA	\$8	
				343			
272A:	20	51	2A	344	JSR	FSAME	
272D:	B0	5C		345	BCS	FLS6	
272F:	A5	06		346	LDA	\$6	
2731:	85	02		347	STA	\$2	
2733:	A5	05		348	LDA	\$5	
2735:	85	01		349	STA	\$1	
2737:	A5	07		350	LDA	\$7	
2739:	85	03		351	STA	\$3	
273B:	A0	00		352	LDY	#0	
273D:	B1	00		353	LDA	(\$0),Y	
273F:	D1	02		354	CMP	(\$2),Y	
2741:	D0	11		355	BNE	FLS1	
2743:	FE	0C		356	INC	\$C	
2745:	CC			357	INY		
2747:	D0	F5		358	BNE	FLL1	
2749:	FE	0D		359	INC	\$D	
274B:	85	03		360	INC	\$3	
274D:	FE	01		361	INC	\$1	
274F:	A5	01		362	LDA	\$1	
2751:	CC	78		363	CMP	#\$78	
2753:	D0	E9		364	BNE	FLL1	
2755:	A4	0C		365	LDY	\$C	
2757:	A6	0D		366	LDX	\$D	
2759:	EC	0C	2C	367	CPX	TSTLH	
275B:	9D	24		368	BCC	FLS2	
275D:	D0	07		369	BNE	FLS3	
275F:	CC	0B	2C	370	CPY	TSTLL	

2752:	90	10	321	BCC	FLS2	
2754:	00	10	322	BEO	FLS2	
2756:	00	2C	323	STX	TSTLH	
2758:	00	2C	324	STY	TSTLL	
2759:	00	00	325	LDA	\$6	
275C:	00	00	326	STA	TSTAL	
275E:	00	2C	327	SEC		
2761:	00		328	SBC	\$4	
2762:	04		329	STA	TRKLL	
2764:	07	B2	330	LDA	\$7	
2767:	00	2C	331	STA	TSTAH	
2769:	00	00	332	SBC	\$5	
276C:	00	B2	333	STA	TRKLH	
2771:	00	00	334	INC	\$6	
2773:	00		335	BNE	FLL0	
2775:	00		336	INC	\$7	
2777:	00		337	DEC	\$8	
2779:	00		338	BNE	FLL0	
277B:	00	2C	339	LDA	TSTLH	
277E:	00	00	340	BNE	FLS5	
2780:	00	2C	341	LDA	TSTLL	
2783:	00	B3	342	CMP	MNBTEQLN	;PARM\$1C
2786:	00		343	BCC	FLS4	
2788:	00	B2	344	LDA	TRKLL	
278B:	00		345	SEC		
278E:	00	B2	346	SBC	TILENL	
2792:	00	B2	347	STA	DIFL	
2795:	00	B2	348	LDA	TRKLH	
2798:	00	B2	349	SBC	TILENH	
279B:	10		350	STA	DIFH	
279C:	00		351	CLC		
279D:	00		352	RTS		
279E:	00		353	SEC		
279F:	A9	27	354	RTS		
27A1:	A0	F3	355	LDA	#>LTLNGTH	;FIND
27A3:	0E	13	356	LDY	#<LTLNGTH	TRACK
27A6:	20	B3	357	LDX	PLNGCNTL	LENGTH
27A9:	00	2A	358	JSR	DOPSUB0	MANAGER
27AA:	A9	27	359	RTS		
27AC:	A0	F9	360	LDA	#>LTEND	;FIND
27AE:	0E	13	361	LDY	#<LTEND	TRACK
27B1:	20	B3	362	LDX	PENDCNTL	END
27B4:	00	2A	363	JSR	DOPSUB0	MANAGER
27B5:	AD	C4	364	RTS		
27B8:	00	B2	365	LDA	TRKDEL	;CALC
27B9:	00	B2	366	SEC		TRACK
27BC:	00	B2	367	SBC	TRKLL	START
27BF:	00	B2	368	STA	TRKDSL	ROUTINE
27C0:	00	B2	369	PHP		
27C3:	00	B2	370	LDA	TRKDEH	
27C6:	00	B2	371	SBC	TRKLH	
27C9:	00	B2	372	STA	TRKDSH	
27CC:	00	B2	373	LDA	TRKTEH	
27CD:	00	B2	374	PLP		
27D0:	00	B2	375	SBC	TRKLH	
27D3:	00	B2	376	STA	TRKTSH	
27D4:	AD	C4	377	RTS		
27D7:	00	B2	378	LDA	TRKDEL	;CALC
27D8:	00	B2	379	SEC		TRACK
27DB:	00	B2	380	SBC	TLENL	START
27DE:	00	B2	381	STA	TRKDSL	FOR
27DF:	00	B2	382	PHP		SYNC
27E2:	AD	C5	383	LDA	TRKDEH	ROUTINE
27E5:	00	B2	384	SBC	TLENH	
27E8:	00	B2	385	STA	TRKDSH	
27EB:	00	B2	386	LDA	TRKTEH	
27EE:	00	B2	387	PLP		
27F1:	00	B2	388	SBC	TLENH	
27F2:	00	B2	389	STA	TRKTSH	
27F3:	FF	27	390	RTS		
27F5:	2C	20	391			
27F7:	CC	20	392			
27F9:	DA	28	393			
27FB:	0F	29	394			
27FD:	E0	29	395			

* ADDRESS TABLES FOR TRACK *			
* LENGTH AND TRACK END ROUTINES *			
*-----*			
LTNGTH	DA	TRKDGL	DATPTRN
	DA	TRKUQL	UNIQUE
	DA	TRKABL	ABSLTE
*-----*			
LTEND	DA	TRKTGE	TIMEGAP
	DA	TRKDPE	DATPTRN
	DA	TRKDGE	DATAGAP



27FF:	A9	03		457				
2801:	20	2A	2C	458	TRKDGL	LDA	#3	MANAGER
2804:	A0	00		459		JSR	CONTROL	FOR
2806:	A9	78		460		LDY	#0	DATA
2808:	20	CB	29	461		LDA	#78	PATTERN
280B:	B0	1C		462		JSR	FTMARKR	TRACK
280D:	A5	01		463		BCS	TDGLE	LENGTH
280F:	85	03		464		LDA	\$1	ROUTINE
2811:	84	02		465		STA	\$3	
2813:	20	03	29	466		STY	\$2	
2816:	B0	11		467		JSR	FTMARKR2	
2818:	98			468		BCS	TDGLE	
2819:	38			469		TYA		
281A:	E5	02		470		SEC		
281C:	8D	C7	B2	471		SBC	\$2	
281F:	A5	01		472		STA	TRKLL	
2821:	E5	03		473		LDA	\$1	
2823:	8D	C8	B2	474		SBC	\$3	
2826:	20	B0	29	475		STA	TRKLH	
2829:	60			476		JSR	CTMARKR	
				477	TDGLE	RTS		
				478				
282A:	38			479	CSERROR	SEC		
282B:	60			480		RTS		
				481				
282C:	AD	C4	B2	482	TRKUQL	LDA	TRKDEL	MANAGER
282F:	18			483		CLC		UNIQUE
2830:	69	08		484		ADC	#8	TRACK
2832:	A8			485		TAY		LENGTH
2833:	AD	C5	B2	486		LDA	TRKDEH	
2836:	18			487		CLC		
2837:	69	00		488		ADC	#0	
2839:	20	0E	2A	489		JSR	CSAME	
283C:	B0	EC		490		BCS	CSERROR	
283E:	D0	EA		491		BNE	CSERROR	
2840:	84	00		492		STY	\$0	
2842:	84	06		493		STY	\$6	
2844:	AD	C5	B2	494		LDA	TRKDEH	
2847:	38			495		SEC		
2848:	E9	1B		496		SBC	#1B	
284A:	85	07		497		STA	\$7	
284C:	A9	08		498		LDA	#8	
284E:	85	08		499		STA	#8	
2850:	A9	00		500		LDA	#0	
2852:	8D	0B	2C	501		STA	TSTLL	
2855:	8D	0C	2C	502		STA	TSTLH	
2858:	20	51	2A	503	TQL0	JSR	FSAME	
285B:	B0	5E		504		BCS	TQS6	
285D:	A5	06		505		LDA	\$6	
285F:	85	02		506		STA	\$2	
2861:	A5	05		507		LDA	\$5	
2863:	85	01		508		STA	\$1	
2865:	A5	07		509		LDA	\$7	
2867:	85	03		510		STA	\$3	
2869:	B1	00		511	TQL1	LDA	(#0),Y	
286B:	D1	02		512		CMP	(#2),Y	
286D:	00	11		513		BNE	TQS1	
286F:	E6	0C		514		INC	\$C	
2871:	C8			515		INY		
2872:	D0	F5		516		BNE	TQL1	
2874:	E6	0D		517		INC	\$D	
2876:	E6	03		518		INC	\$3	
2878:	E6	01		519		INC	\$1	
287A:	A5	01		520		LDA	\$1	
287C:	C9	78		521		CMP	#78	
287E:	D0	E9		522		BNE	TQL1	
2880:	A4	0C		523	TQS1	LDY	\$C	
2882:	A6	0D		524		LDX	\$D	
2884:	EC	0C	2C	525		CPX	TSTLH	
2887:	90	28		526		BCC	TQS2	
2889:	D0	07		527		BNE	TQS3	
288B:	CC	0B	2C	528		CPY	TSTLL	
288E:	90	21		529		BCC	TQS2	
2890:	F0	1F		530		BEQ	TQS2	
2892:	8C	0B	2C	531	TQS3	STY	TSTLL	
2895:	8E	0C	2C	532		STX	TSTLH	
2898:	A5	06		533		LDA	\$6	
289A:	8D	0D	2C	534		STA	TSTAL	
289D:	A5	07		535		LDA	\$7	
289F:	8D	0E	2C	536		STA	TSTAH	
28A2:	A5	04		537		LDA	\$4	
28A4:	38			538		SEC		
28A5:	E5	06		539		SBC	\$6	
28A7:	8D	C7	B2	540		STA	TRKLL	
28AA:	A5	05		541		LDA	\$5	
28AC:	E5	07		542		SBC	\$7	

28AE:	8D	C8	B2	543	TQS2	STA	TRKLH	
28B1:	E6	06		544	INC	\$6		
28B3:	D0	A3		545	BNE	TQL0		
28B5:	E6	07		546	INC	\$7		
28B7:	C6	08		547	DEC	\$8		
28B9:	D0	9D		548	BNE	TQL0		
28BB:	AD	0C	2C	549	LDA	TSTLH		
28BE:	D0	08		550	BNE	TQS5		
28C0:	AD	08	2C	551	LDA	TSTLL		
28C3:	CD	1C	B3	552	CMP	MNBT EQLN		;PARM\$1C
28C6:	90	02		553	BCC	TQS4		
28C8:	18			554	TQS5	CLC		
28C9:	60			555	TQS4	RTS		
28CA:	38			556	SEC			
28CB:	60			557	RTS			
28CC:	AD	0C	B3	559	TRKABL	LDA	ABSLNGTL	;ABSOLUTE
28CE:	8D	C7	B2	560	STA	TRKLL		;LENGTH
28D2:	AD	0D	B3	561	LDA	ABSLNGTH		;ROUTINE
28D5:	8D	C8	B2	562	STA	TRKLH		
28D8:	18			563	CLC			
28D9:	60			564	RTS			
28DA:	A9	93		565	TRKTGE	LDA	#\$93	;MANAGER
28DC:	85	01		567	STA	\$1		;TIMING
28DE:	A9	80		568	LDA	#\$B0		;GAP
28E0:	8D	21	2C	569	STA	ENDBCHK		;TRACK
28E3:	A0	00		570	LDY	#0		;END
28E5:	84	00		571	STY	\$0		
28E7:	8C	C4	B2	572	STY	TRKDEL		
28EA:	8C	C6	B2	573	STY	TRKTEH		
28ED:	8C	10	2C	574	STY	TGLL		
28F0:	8C	11	2C	575	STY	TGLH		
28F3:	B1	00		576	LDA	(#0),Y		
28F5:	F0	15		577	BEQ	FTGL3		
28F7:	E6	00		578	INC	\$0		
28F9:	D0	F8		579	BNE	FTGL1		
28FB:	E6	01		580	INC	\$1		
28FD:	A5	01		581	LDA	\$1		
28FF:	CD	21	2C	582	CMP	ENDBCHK		
2902:	D0	EF		583	BNE	FTGL1		
2904:	A9	83		584	LDA	#\$83		
2906:	38			585	FTGDE	SEC		
2907:	60			586	RTS			
2908:	B1	00		587	FTGL2	LDA	(#0),Y	
290A:	D0	2E		588	BNE	FTGS1		
290C:	E6	00		589	INC	\$0		
290E:	D0	F8		590	BNE	FTGL2		
2910:	E6	01		591	INC	\$1		
2912:	A5	01		592	LDA	\$1		
2914:	CD	21	2C	593	CMP	ENDBCHK		
2917:	90	EF		594	BCC	FTGL2		
2919:	AC	11	2C	595	LDY	TGLH		
291C:	D0	0A		596	BNE	FTGD		
291E:	AC	10	2C	597	LDY	TGLL		
2921:	CC	17	B3	598	CPY	PTGAPMIN		
2924:	A9	84		599	LDA	#\$84		
2926:	90	DE		600	BCC	FTGDE		
2928:	CE	C4	B2	601	DEC	TRKDEL		
292B:	AD	C4	B2	602	LDA	TRKDEL		
292E:	C9	FF		603	CMP	#\$FF		
2930:	D0	06		604	BNE	FTGD1		
2933:	CE	C5	B2	605	DEC	TRKDEH		
2935:	CE	C6	B2	606	DEC	TRKTEH		
2938:	18			607	FTGD1	CLC		
2939:	60			608	RTS			
293A:	A5	00		609	FTGS1	LDA	\$0	
293C:	8D	22	2C	610	STA	TTGAL		
293E:	A5	01		611	LDA	\$1		
2941:	8D	23	2C	612	STA	TTGAH		
2944:	E6	00		613	INC	\$0		
2946:	D0	08		614	BNE	FTGS2		
2948:	E6	01		615	INC	\$1		
294A:	A5	01		616	LDA	\$1		
294C:	C9	B0		617	CMP	#\$B0		
294E:	B0	04		618	BCS	FTGS4		
2950:	B1	00		619	LDA	(#0),Y		
2952:	D0	F0		620	BNE	FTGL5		
2954:	A5	00		621	FTGS4	LDA	\$0	
2956:	38			622	SEC			
2957:	ED	22	2C	623	SBC	TTGAL		
295A:	AA			624	TAX			
295B:	A5	01		625	LDA	\$1		
295D:	ED	23	2C	626	SBC	TTGAH		
2960:	CD	11	2C	627	CMP	TGLH		
2963:	90	21		628	BCC	FTGS5		

2965	DO	07	629	BNE	FTGS3	
2966	FECC	10	630	CPX	TGLL	
2967	FE00	1A	631	BCC	FTGS5	
2968	FE00	1B	632	BEQ	FTGS5	
2969	FE00	11	633	STX	TGLL	FTGS3
2970	FE00	11	634	STA	TGLH	
2971	FE00	2C	635	LDA	TTGAL	
2972	FE00	2C	636	STA	TRKDEL	
2973	FE00	2C	637	LDA	TTGAH	
2974	FE00	2C	638	STA	TRKTEH	
2975	FE00	2C	639	SEC		
2976	FE00	2C	640	SBC	##38	
2977	FE00	2C	641	STA	TRKDEH	
2978	FE00	2C	642	LDA	\$1	FTGS5
2979	FE00	2C	643	CMP	##B0	
2980	FE00	2C	644	BNE	FTGL3	
2981	FE00	2C	645	JMP	FTGL4	
2982	FE00	2C	646			
2983	FE00	2C	647	LDA	#2	TRKDPE
2984	FE00	2C	648	JSR	CONTROL	MANAGER
2985	FE00	2C	649	LDY	#0	DATA
2986	FE00	2C	650	LDA	##95	PATTERN
2987	FE00	2C	651	JSR	FTMARKR	TRACK
2988	FE00	2C	652	BCC	TDPE2	END
2989	FE00	2C	653	JSR	CTMARKR	
2990	FE00	2C	654	SEC		
2991	FE00	2C	655	RTS		
2992	FE00	2C	656	STY	TRKDEL	
2993	FE00	2C	657	LDA	\$1	TDPE2
2994	FE00	2C	658	STA	TRKTEH	
2995	FE00	2C	659	SEC		
2996	FE00	2C	660	SBC	##38	
2997	FE00	2C	661	STA	TRKDEH	
2998	FE00	2C	662	LDY	#0	CTMARKR
2999	FE00	2C	663	LDA	##78	
3000	FE00	2C	664	STA	\$1	TDPE3
3001	FE00	2C	665	LDA	(<#0),Y	
3002	FE00	2C	666	BPL	TDPE4	
3003	FE00	2C	667	AND	##7F	TDPE3
3004	FE00	2C	668	STA	(<#0),Y	
3005	FE00	2C	669	INY		TDPE4
3006	FE00	2C	670	BNE	TDPE3	
3007	FE00	2C	671	INC	\$1	
3008	FE00	2C	672	LDA	\$1	
3009	FE00	2C	673	CMP	##B0	
3010	FE00	2C	674	BNE	TDPE3	
3011	FE00	2C	675	CLC		FTMDN
3012	FE00	2C	676	RTS		
3013	FE00	2C	677			
3014	FE00	2C	678	FTMARKR	STY \$0	FTMARKR
3015	FE00	2C	679	STA	\$1	
3016	FE00	2C	680	LDA	(<#0),Y	FTMARKR1
3017	FE00	2C	681	BMI	FTMDN	
3018	FE00	2C	682	INY		FTMARKR2
3019	FE00	2C	683	BNE	FTMARKR1	
3020	FE00	2C	684	INC	\$1	
3021	FE00	2C	685	LDA	\$1	
3022	FE00	2C	686	CMP	##AF	
3023	FE00	2C	687	BNE	FTMARKR1	
3024	FE00	2C	688	SEC		
3025	FE00	2C	689	RTS		
3026	FE00	2C	690			
3027	FE00	2C	691	LDA	##5C	TRKDGE
3028	FE00	2C	692	STA	\$1	
3029	FE00	2C	693	LDY	#0	
3030	FE00	2C	694	STY	\$0	
3031	FE00	2C	695	LDA	(<#0),Y	
3032	FE00	2C	696	INY		FEG3
3033	FE00	2C	697	BNE	FEG1	
3034	FE00	2C	698	INC	\$1	
3035	FE00	2C	699	LDX	\$1	
3036	FE00	2C	700	CPX	##78	
3037	FE00	2C	701	BNE	FEG1	
3038	FE00	2C	702	LDA	##85	
3039	FE00	2C	703	JMP	FTGDE	
3040	FE00	2C	704	CMP	(<#0),Y	FEG1
3041	FE00	2C	705	BEQ	FEG3	
3042	FE00	2C	706	STY	TRKDEL	
3043	FE00	2C	707	LDA	\$1	
3044	FE00	2C	708	STA	TRKDEH	
3045	FE00	2C	709	CLC		
3046	FE00	2C	710	ADC	##38	
3047	FE00	2C	711	STA	TRKTEH	
3048	FE00	2C	712	CLC		
3049	FE00	2C	713	RTS		
3050	FE00	2C	714			

```

2A0E: 85 05 215 *****
2A10: 85 0B 216
2A12: 85 00 217
2A14: 85 04 218
2A16: 85 0A 219
2A18: 85 08 220
2A1A: 85 04 221
2A1C: 8D 0F 222
2A1E: 0C 08 223
2A20: 00 08 224
2A22: E6 05 225
2A24: A6 07 226
2A26: F0 0C 227
2A28: F0 0C 228
2A2A: 01 04 229
2A2C: F0 F1 230
2A2E: A5 05 231
2A30: 84 04 232
2A32: A2 00 233
2A34: 18 234
2A36: 60 235
2A38: 88 236
2A3A: 00 FF 237
2A3C: 00 08 238
2A3E: A6 0B 239
2A40: F0 5B 240
2A42: F0 0B 241
2A44: 01 0A 242
2A46: F0 FF 243
2A48: A5 0B 244
2A4A: 84 0A 245
2A4C: A2 01 246
2A4E: 18 247
2A50: 60 248

2A51: A4 06 249
2A53: A9 00 250
2A55: 85 06 251
2A57: 85 0C 252
2A59: 85 00 253
2A5B: AD 0F 254
2A5E: 01 06 255
2A60: F0 0B 256
2A62: C8 257
2A64: 00 F9 258
2A66: E6 07 259
2A68: C6 08 260
2A6A: 00 F3 261
2A6C: 38 262
2A6E: 60 263
2A70: A5 07 264
2A72: 85 0B 265
2A74: 84 0A 266
2A76: AD 0F 267
2A78: C8 268
2A7A: 00 06 269
2A7C: E6 07 270
2A7E: C6 08 271
2A80: F0 EC 272
2A82: E6 0C 273
2A84: 00 02 274
2A86: E6 0D 275
2A88: 01 06 276
2A8A: F0 ED 277
2A8C: 84 06 278
2A8E: 18 279
2A90: 60 280

2A90: AD C6 B2 281
2A92: AE C4 B2 282
2A94: A0 AF 283
2A96: 8C C6 B2 284
2A98: 84 03 285
2A9A: A0 FF 286
2A9C: 84 02 287
2A9E: A0 00 288
2AA0: 20 B7 2A 289
2AA2: AD C5 B2 290
2AA4: AE C4 B2 291
2AA6: 20 B7 2A 292
2AA8: 84 03 293
2AAE: 8D C5 B2 294
295

CSAME STA $5 COUNT
STA $B ALL THE
LDA #0 BYTES
STA $4 WHICH
STA $A ARE THE
STY $8 SAME
LDA ($4),Y IN A
STA SGVAL ROW

CSL1 INY
BNE CSS1
INC $5
LDX $5
CPX #$78
BEQ CSHTEND
CSS1 CMP ($4),Y
BEQ CSL1
LDA $5
STY $4
LDX #0
CLC
RTS

CSHTEND LDY $8
CSL2 DEY
CPY #$FF
BNE CSS2
DEC $B
LDX $B
CPX #$5B
BEQ ALLSAME
CSS2 CMP ($A),Y
BEQ CSL2
LDA $B
STY $A
LDX #1
CLC
RTS

ALLSAME RTS

FSAME LDY $6
LDA #0
STA $6
STA $C
STA $D
LDA SGVAL
FSL1 CMP ($6),Y
BEQ FSGTONE
INY
BNE FSL1
INC $7
DEC $8
BNE FSL1
FSE SEC
RTS
FSGTONE LDA $7
STA $B
STY $A
LDA SGVAL
FSL2 INY
BNE FSS1
INC $7
DEC $8
BEQ FSE
FSS1 INC $C
BNE FSS2
INC $D
FSS2 CMP ($6),Y
BEQ FSL2
STY $6
CLC
RTS

MOVEBUFF LDA TRKTEH
LDX TRKDEL
LDY #$AF
STY TRKTEH
STY $3
LDY #$FF
STY $2
LDY #0
JSR MOVE
LDA TRKDEH
LDX TRKDEL
JSR MOVE
LDA #$93
STA TRKDEH

```

2AB1:	A9	FF		801	LDA	##FF	
2AB3:	8D	C4	B2	802	STA	TRKDEL	
2AB6:	60			803	RTS		
				804			
2AB7:	85	01		805	MOVE	STA	\$1
2AB9:	86	00		806		STX	\$0
2ABB:	A9	1C		807		LDA	##1C
2ABD:	85	05		808		STA	\$5
2ABF:	B1	00		809	ML1	LDA	(\$0),Y
2AC1:	91	02		810		STA	(\$2),Y
2AC3:	C6	00		811		DEC	\$0
2AC5:	A5	00		812		LDA	\$0
2AC7:	C9	FF		813		CMP	##FF
2AC9:	D0	02		814		BNE	MS1
2ACB:	C6	01		815		DEC	\$1
2ACD:	C6	02		816	MS1	DEC	\$2
2ACF:	A5	02		817		LDA	\$2
2AD1:	C9	FF		818		CMP	##FF
2AD3:	D0	EA		819		BNE	ML1
2AD5:	C6	03		820		DEC	\$3
2AD7:	C6	05		821		DEC	\$5
2AD9:	D0	E4		822		BNE	ML1
2ADB:	60			823		RTS	
				824			
				825			
				826			
				827			
				828			
				829			
				830			
				831			
				832			
				833			
				834			
				835			
				836			
				837			
				838			
				839			
2ADC:	85	05		840	DOPSUBO	STA	\$5
2ADE:	84	04		841		STY	\$4
2AE0:	8E	24	2C	842		STX	ODPTRN
2AE3:	A9	07		843		LDA	#7
2AE5:	8D	25	2C	844	DOPL1	STA	ODCNTR
2AE8:	A9	02		845		LDA	#2
2AEA:	8D	26	2C	846	DOPL2	STA	ODPNTR
2AED:	0E	24	2C	847		ASL	ODPTRN
2AF0:	90	16		848		BCC	DOPS1
2AF2:	AD	26	2C	849		LDA	ODPNTR
2AF5:	0A			850		ASLA	
2AF6:	A8			851		TAY	
2AF7:	B1	04		852		LDA	(\$4),Y
2AF9:	85	00		853		STA	\$0
2AFB:	C8			854		INY	
2AFC:	B1	04		855		LDA	(\$4),Y
2AFF:	85	01		856		STA	\$1
2B00:	20	14	2B	857		JSR	IJMP0
2B03:	90	16		858		BCC	DOPD
2B05:	8D	C9	B2	859		STA	ERRORCD
2B08:	CE	25	2C	860	DOPS1	DEC	ODCNTR
2B0B:	F0	0A		861		BEQ	DOPDE
2B0D:	CE	26	2C	862		DEC	ODPNTR
2B10:	10	DB		863		BPL	DOPL2
2B12:	30	04		864		BMI	DOPL1
2B14:	6C	00	00	865	IJMP0	JMP	(\$0)
2B17:	38			866	DOPDE	SEC	
2B18:	AD	C9	B2	867		LDA	ERRORCD
2B1B:	60			868	DOPD	RTS	
				869			
2B1C:	AD	C1	B2	870	NCAUTO	LDA	TRKDSL
2B1F:	18			871		CLC	
2B20:	69	10		872		ADC	##10
2B22:	A8			873		TAY	
2B23:	A9	00		874		LDA	#0
2B25:	85	00		875		STA	\$0
2B27:	85	05		876		STA	\$5
2B29:	6D	C3	B2	877		ADC	TRKTSH
2B2C:	85	01		878		STA	\$1
2B2E:	AD	BC	B2	879		LDA	DIFH
2B31:	30	2E		880	CREATE	BMI	CHOP
2B33:	A9	01		881		LDA	#1
2B35:	85	03		882		STA	\$3
2B37:	A9	02		883		LDA	#2
2B39:	85	04		884		STA	\$4
2B3B:	A9	08		885	CRTL2	LDA	#8
2B3D:	85	06		886		STA	\$6
2B3F:	20	83	2B		CRTL1	JSR	NXTIME
2B42:	B0	18				BCS	CRTD

\*\*\*\*\*  
 \* DOPSUBO: DO PARM JSR ORDER  
 \* A/Y = HIGH/LOW = JSR TABLE  
 \* X = KEY ORDER PATRN (3213 213X)  
 \* EXAMPLES:  
 \* ORDER 1,2,3 = 0010 1010 (\$2A)  
 \* ORDER 3,2,1 = 1110 0000 (\$E0)  
 \* ORDER 2 ONLY = 0100 0000 (\$40)  
 \*\*\*\*\*

\*\*\*\*\*  
 DOPSUBO STA \$5 ;JSR  
 STY \$4 ;PARM  
 STX ODPTRN ;ORDER  
 LDA #7  
 STA ODCNTR ;A=LTAH  
 DOPL1 LDA #2 ;Y=LTAL  
 STA ODPNTR ;X=PATRN  
 DOPL2 ASL ODPTRN  
 BCC DOPS1  
 LDA ODPNTR  
 ASLA  
 TAY  
 LDA (\$4),Y  
 STA \$0  
 INY  
 LDA (\$4),Y  
 STA \$1  
 JSR IJMP0  
 BCC DOPD  
 STA ERRORCD  
 DOPS1 DEC ODCNTR  
 BEQ DOPDE  
 DEC ODPNTR  
 BPL DOPL2  
 BMI DOPL1  
 IJMP0 JMP (\$0)  
 DOPDE SEC ;ERROR  
 LDA ERRORCD  
 DOPD RTS  
 \*\*\*\*\*

NCAUTO LDA TRKDSL ;MANAGER  
 CLC ;AUTO  
 ADC ##10 ;NIBBLE  
 TAY ;COUNT  
 LDA #0  
 STA \$0  
 STA \$5  
 ADC TRKTSH  
 STA \$1  
 LDA DIFH  
 BMI CHOP  
 CREATE LDA #1  
 STA \$3  
 LDA #2  
 STA \$4  
 LDA #8  
 STA \$6  
 CRTL2 JSR NXTIME  
 CRTL1 BCS CRTD



2BEE:	65	03	973	ADC	#3	
2BF0:	80	28	974	STA	WSYNCH	
2BF3:	AD	27	975	LDA	WSYNCL	
2BF6:	38		976	SEC		
2BF7:	E9	07	977	SBC	#7	
2BF9:	80	27	978	STA	WSYNCL	
2BFC:	AD	28	979	LDA	WSYNCH	
2BFF:	E9	00	980	SBC	#0	
2C01:	80	28	981	STA	WSYNCH	
2C04:	60		982	RTS		
			983			
			984	*-----*		
			985	* STORAGE AND WORKSPACE *		
			986	*-----*		
2C05:	00		987	DGL1L	DFB	0 DATA
2C06:	00		988	DGL2L	DFB	0 LENGTH
2C07:	00		989	DGL2H	DFB	0
2C08:	00		990	TDGL1L	DFB	0
2C09:	00		991	TDGL1H	DFB	0
2C0A:	00		992	TDGL2L	DFB	0
2C0B:	00		993	TSTLL	DFB	0 UNIQUE
2C0C:	00		994	TSTLH	DFB	0 LENGTH
2C0D:	00		995	TSTAL	DFB	0
2C0E:	00		996	TSTAH	DFB	0
2C0F:	00		997	SGVAL	DFB	0
2C10:	00		998	TGLL	DFB	0 TIMEGAP
2C11:	00		999	TGLH	DFB	0 LENGTH
2C12:	00		1000	TTRKLL	DFB	0 TEST
2C13:	00		1001	TTRKLLH	DFB	0 LENGTH
2C14:	00		1002	TDGSA2L	DFB	0 TEST
2C15:	00		1003	TDGSA2H	DFB	0 START
2C16:	00		1004	DGSA1L	DFB	0 DATA
2C17:	00		1005	DGSA2L	DFB	0 START
2C18:	00		1006	DGSA2H	DFB	0 ADDRESS
2C19:	00		1007	DGEA1L	DFB	0 DATA
2C1A:	00		1008	DGEA2L	DFB	0 END
2C1B:	00		1009	DGEA2H	DFB	0 ADDRESS
2C1C:	00		1010	WS1L	DFB	0
2C1D:	00		1011	WS1H	DFB	0
2C1E:	00		1012	WS2L	DFB	0
2C1F:	00		1013	WS2H	DFB	0
2C20:	00		1014	ESRC	DFB	0
2C21:	00		1015	ENDBCHK	DFB	0
2C22:	00		1016	TTGAL	DFB	0
2C23:	00		1017	TTGAH	DFB	0
2C24:	00		1018	ODPTRN	DFB	0
2C25:	00		1019	ODCNTR	DFB	0
2C26:	00		1020	ODPNTR	DFB	0
2C27:	00		1021	WSYNCL	DFB	0
2C28:	00		1022	WSYNCH	DFB	0

--End assembly--

1577 bytes

Errors: 0

```

199 *****
200 * ESSENTIAL DATA DUPLICATOR
201 * VERSION 4.2 STANDARD/PLUS
202 * 6502 ASSEMBLY SOURCE CODE
203 * COPYRIGHT (C) 1986
204 * ALL RIGHTS RESERVED
205 * UTILICO MICROWARE
206 * DONALD ANTHONY SCHNAPP
207 * PRINTED APRIL 23, 1986
208 *****
209
210 *****
211 * CONTROL ROUTINES *
212 * $2C2A-$2FFF *
213 *****
214
215 RDP EQU $0
216 RDWRKP EQU $2
217 RTWRKP EQU $4
218 CPP EQU $6
219 CPWP EQU $8
220 ZWRKSPC EQU $FE
221
222 -----
223 * INSTRUCTION BYTES:
224 *
225 * 1XXX XXXX = DATA
226 * 0000 00XX = TIMING
227 *
228 * $03 MATCH OR FIND ONE TIMING
229 *   BYTE DURING SEARCH
230 *
231 * $10 ANLDONE; ROUTINE DONE
232 *
233 * $20 START SUB FLAG (TCPPSUB)
234 * $21 RETURN SUB (TSUBCPP)
235 *   IF SUB IS DONE, RESET
236 *   SUB FLAG
237 *
238 * $30 SEARCH MODE, SET DATA
239 *   BUFF POINTER TO $4000
240 * $31 SEARCH MODE, CONTINUE DATA
241 *   BUFF PNTR FROM S/R END
242 * $32 SEARCH MODE, SET DATA BUFF
243 *   POINTER TO S/R START
244 *
245 * $35 REPLACE MODE, CONTINUE DATA
246 *   BUFF PNTR FROM S/R END
247 * $36 REPLACE MODE, SET DATA
248 *   BUFF PNTR TO S/R START
249 *
250 * $40 TRANSFER RDP TO WORK
251 * $41 TRANSFER WORK TO RDP
252 * $42 TRANSFER RDP TO STORAGE
253 * $43 TRANSFER STORAGE TO RDP
254 *
255 * $50 FIND NEXT INVALID BYTE
256 * $51 FIND NEXT NON $FF
257 * $55 RPLC DATA WITH RANDOM VALID
258 * $56 RPLC DATA WITH RNDM INVALID
259 * $57 RPLC WITH RNDM VERY INVLD
260 * $58 RPLC DATA WITH ZERO
261 *
262 * $60 ADD NXT 2 BYTES TO RDWRKP
263 * $61 SUB NXT 2 BYTES FRM RDWRKP
264 * $62 ADD NEXT TWO BYTES TO RDP
265 * $63 SUB NXT TWO BYTES FRM RDP
266 *
267 * $70 SINGLE CHAR WILDCARD
268 * $71 MULTBLE CHAR WILDCARD
269 *   AND RESET RDP
270 *
271 * $73 SET TIMING BYTE HIGH BIT
272 *   OR LOCATING TEND/TLENGTH
273 *
274 * $75 BREAK INTO MONITOR
275 *
276 * NON-COMMANDS ARE IGNORED
277 *
278 *****
279
280
281
282 ORG CONTROL ;2C2A

```



2C2A	A2	B3	283	LDX	#>PARMS	:MANAGER
2C2B	A0	80	284	LDY	##80	:CONTROL
2C2C	C9	02	285	CMP	#2	
2C2D	F0	10	286	BEQ	SSKIP2	:A=CNTRL
2C2E	A0	00	287	LDY	##C0	:ROUTINE
2C2F	C9	03	288	CMP	#3	:TO USE:
2C30	F0	0A	289	BEQ	SSKIP2	:0=PRE
2C31	A0	00	290	LDX	#>PREANLZ	:1=CNTRL
2C32	C9	00	291	CMP	#0	:2=TEND
2C33	F0	02	292	BEQ	SSKIP	:3=TLNG
2C34	A0	B1	293	LDX	#>CONTRLP	
2C35	C9	00	294	LDY	#0	
2C36	F0	07	295	STX	CPP+1	
2C37	A0	00	296	LDA	#0	
2C38	C9	06	297	STA	CPP	
2C39	F0	06	298	LDA	(CPP),Y	
2C3A	A0	00	299	BEQ	CDONE1	
2C3B	C9	06	300	STA	CPP	
2C3C	F0	00	301	LDY	#0	
2C3D	A0	FC	302	JSR	TCPPWRK	
2C3E	C9	15	303	JSR	SSETUP	
2C3F	F0	60	304	JMP	COMMAND	
2C40	A0	60	305	RTS		
2C41			306			
2C42	20	FC	307	ERROR	JSR	TCPPWRK
2C43	A0	7F	308	JSR	CLRMPFLG	
2C44	C9	B1	309	LDA	(CPWP),Y	:GET A
2C45	F0	71	310	JSR	COMR1	:COMMAND
2C46	A0	05	311	BCC	INCMND	:FROM
2C47	C9	2D	312	LDX	ENDBFLAG	:INSTRCT
2C48	F0	FF	313	BEQ	ERROR	:BUFFER
2C49	A0	08	314	INC	CPWP	
2C4A	C9	60	315	JMP	COMMAND	
2C4B	F0	76	316	JSR	COMR2	
2C4C	A0	18	317	CLC		
2C4D	C9	60	318	RTS		
2C4E			319			
2C4F	30	23	320	COMR2	BMI	DATABYTE
2C50	A0		321	TAX		:START
2C51	C9	FC	322	AND	##FC	:TO
2C52	F0		323	PHP		:DECODE
2C53	A0		324	TXA		:COMMAND
2C54	C9		325	PLP		
2C55	F0	43	326	BEQ	TIMEBYTE	
2C56	A0	19	327	LDX	##19	
2C57	C9	34	328	CMP	LTCINST,X	:FINISH
2C58	F0	04	329	BEQ	COMS1	:DECODE
2C59	A0		330	DEX		
2C5A	C9	10	331	BPL	COML2	
2C5B	F0	F8	332	RTS		
2C5C	A0	60	333			
2C5D			334			
2C5E	8A		335	COMS1	TXA	:SETUP
2C5F	C9		336	ASLA		:COMMAND
2C60	F0		337	TAX		:POINTER
2C61	A0	4E	338	LDA	LTAINST,X	:AND
2C62	C9	FF	339	STA	ZWRKSPC	:DO
2C63	F0	4F	340	LDA	LTAINST+1,X	:THE
2C64	A0	FF	341	STA	ZWRKSPC+1	:COMMAND
2C65	C9	6C	342	JMP	(ZWRKSPC)	
2C66	F0	00	343			
2C67			344			
2C68	20	8E	345	DATABYTE	JSR	INCDT3
2C69	A0	2A	346	LDX	IMODE	:MANAGER
2C6A	C9	05	347	BEQ	DBFIND	:DATA
2C6B	F0	03	348	STA	(RDWRKP),Y	:BYTE
2C6C	A0	BF	349	JMP	DBFS1	:REPLACE
2C6D	C9	2B	350	LDX	MPFLAG	
2C6E	F0	0B	351	BEQ	DBFINDMW	:SEARCH
2C6F	A0	02	352	CMP	(RDWRKP),Y	
2C70	C9	0E	353	BEQ	DBFS1	
2C71	F0		354	PLA		
2C72	A0		355	PLA		
2C73	C9		356	SEC		
2C74	F0		357	RTS		
2C75			358			
2C76	20	99	359	DBFL1	JSR	INCDT
2C77	A0	02	360	DBFINDMW	(RDWRKP),Y	:MULTBLE
2C78	C9	F9	361	CMP	DBFL1	:WILD
2C79	F0	C5	362	BNE	PATFSET	:CARD
2C7A	A0	84	363	DBFS1	SETINCF	
2C7B	C9	60	364	RTS		
2C7C	F0		365			
2C7D			366			
2C7E	C9	03	367	TIMEBYTE	CMP	#3
2C7F	A0	28	368	BEQ	TIMEWLD	:MANAGER
2C80	C9	94		JSR	INCDT2	:TIME
2C81	F0	2A		LDX	IMODE	:BITS
2C82	A0	05		BEQ	TBFIND	
2C83	C9	04		STA	(RTWRKP),Y	:REPLACE

2CD1:	4C	FB	2C	369	TBFL1	JMP	TBFS1	
2CD4:	AF	2B	2F	370	LDX	MPFLAG		;SEARCH
2CD7:	F0	0B		371	BEQ	TBFL1		
2CD9:	D1	04		372	CMP	(RTWRKP),Y		
2CDB:	F0	0E		373	BEQ	TBFS1		
2CDD:	68			374	PLA			
2CDE:	68			375	PLA			
2CDF:	38			376	SEC			
2CF0:	60			377	RTS			
2CF1:	20	99	2E	378	JSR	INCDT		
2CF4:	D1	04		379	CMP	(RTWRKP),Y		;MULTBLE
2CF6:	D0	F9		380	BNE	TBFL1		;WILD
2CF8:	20	C5	2E	381	JSR	PATFSET		;CARD
2CEB:	20	88	2E	382	JSR	SETINCN		
2CEE:	60			383	RTS			
2CF2:	20	94	2E	384	JSR	INCDT2		;INSTRCT
2CF5:	AF	2B	2F	385	LDX	MPFLAG		;#03
2CF7:	F0	0B		386	BEQ	TMWS1		
2CF9:	B1	04		387	LDA	(RTWRKP),Y		
2CFB:	D0	0E		388	BNE	TMWS2		
2CFC:	68			389	PLA			
2CFD:	68			390	PLA			
2CFE:	38			391	SEC			
2CF0:	60			392	RTS			
2002:	20	99	2E	393	JSR	INCDT		
2004:	B1	04		394	LDA	(RTWRKP),Y		
2006:	F0	F9		395	BEQ	TMWL1		
2008:	20	C5	2E	396	JSR	PATFSET		
2009:	20	88	2E	397	JSR	SETINCN		
200C:	60			398	RTS			
2D0D:	68			400	PLA			;INSTRCT
2D0E:	68			401	PLA			;#10
2D0F:	68			402	PLA			
2D10:	68			403	PLA			
2D11:	60			404	RTS			
2D12:	20	05	2F	406	SSETUP1	JSR	TWRKCPPI	
2D15:	20	69	2E	407	SSETUP	JSR	RSETUP	
2D18:	4C	1E	2D	408	JMP	SSBS1		
2D1B:	20	05	2F	409	STRTSUB	JSR	TWRKCPPI	;INSTRCT
2D1E:	A6	06		410	SSBS1	LDX	CPP	;#20
2D20:	8F	30	2F	411	STX	SUBPNTR		
2D23:	60			412	RTS			
2D24:	AE	2D	2F	413	RTRNSUB	LDX	ENDBFLAG	;INSTRCT
2D27:	D0	E9		414	BNE	SSETUP1		;#21
2D29:	AE	30	2F	415	LDX	SUBPNTR		
2D2C:	84	06		416	STX	CPP		
2D2E:	20	FC	2E	417	JSR	TCPPWRK		
2D31:	C6	08		418	DEC	CPWP		
2D33:	60			419	RTS			
2D34:	A9	00		420	CIMODE	LDA	#0	;INSTRCT
2D36:	F0	02		421	BEQ	DOMODE		;#31
2D38:	A9	01		422	LDA	#1		;INSTRCT
2D3A:	8D	2A	2F	423	DOMODE	STA	IMODE	;#35
2D3D:	20	94	2E	424	JSR	INCDT2		
2D40:	20	CD	2E	425	JSR	TWRKRDP		
2D43:	4C	05	2F	426	JMP	TWRKCPPI		
2D46:	A9	00		427	CIMODER	LDA	#0	;INSTRCT
2D48:	F0	02		428	BEQ	DOMODE2		;#32
2D4A:	A9	01		429	LDA	#1		;INSTRCT
2D4C:	8D	2A	2F	430	DOMODE2	STA	IMODE	;#36
2D4F:	20	D9	2E	431	JSR	TRDPWRK		
2D52:	4C	05	2F	432	JMP	TWRKCPPI		
2D55:	20	69	2E	433	CIMODES	JSR	RSETUP	;INSTRCT
2D58:	4C	05	2F	434	JMP	TWRKCPPI		;#30
2D5B:	20	8E	2E	435	FINVLD	JSR	INCDT3	
2D5E:	4C	64	2D	436	JMP	FINL3		
2D61:	20	99	2E	437	FINL1	JSR	INCDT	
2D64:	B1	05		438	FINL3	LDA	(RTWRKP),Y	;INSTRCT
2D66:	85	FE		439	STA	ZWRKSPC		;#50
2D68:	A2	07		440	LDX	#7		
2D6A:	CA			441	DEX			
2D6B:	30	F4		442	BMI	FINL1		
2D6D:	A5	FE		443	LDA	ZWRKSPC		
2D6F:	30	82	2F	444	AND	LTFINVLD,X		
2D72:	D0	F6		445	BNE	FINL2		
2D74:	20	CD	2E	446	JSR	TWRKRDP		
2D77:	20	84	2E	447	JSR	SETINCF		
2D7A:	60			448	RTS			

2D7B:	20	8E	2E	455	FNONFF	JSR	INCDT3		
2D7E:	20	4C	2D	456		JMP	FNFL2		
2D81:	20	99	2E	457	FNFL1	JSR	INCDT		
2D84:	B1	02		458	FNFL2	LDA	(R0WRKP),Y	::INSTRCT	
2D87:	C9	FF		459		CMP	##FF	::#51	
2D88:	F0	FF		460		BEQ	FNFL1		
2D8A:	20	CD	2E	461		JSR	RTWRKOP		
2D8D:	20	84	2E	462		JSR	SETINCF		
2D90:	60			463		RTS			
2D91:	20	94	2E	464	RRVALID	JSR	INCDT2		
2D94:	EE	31	2F	465		INC	RNDMULD	::INSTRCT	
2D97:	AE	31	2F	466		LDX	RNDMULD	::#52	
2D9A:	FE	42		467		CPX	##42		
2D9C:	D0	05		468		BNE	RRVS1		
2D9E:	A2	00		469		LDX	#0		
2DA0:	8E	31	2F	470		STX	RNDMULD		
2DA3:	BD	89	2F	471	RRVS1	LDA	LTRVALID,X		
2DA6:	91	02		472		STA	(R0WRKP),Y		
2DA8:	20	99	2E	473		JSR	INCDT		
2DAB:	60			474		RTS			
2DAC:	20	94	2E	475	RRINULD	JSR	INCDT2		
2DAF:	EE	32	2F	476		INC	RNDMINV	::INSTRCT	
2DB2:	AE	32	2F	477		LDX	RNDMINV	::#56	
2DB5:	FE	02		478		CPX	##2E		
2DB7:	D0	05		479		BNE	RRIS1		
2DB9:	A2	00		480		LDX	#0		
2DBB:	8E	32	2F	481		STX	RNDMINV		
2DBE:	BD	CB	2F	482	RRIS1	LDA	LTRINULD,X		
2DC1:	91	02		483		STA	(R0WRKP),Y		
2DC3:	20	99	2E	484		JSR	INCDT		
2DC6:	60			485		RTS			
2DC7:	20	94	2E	486	RRIVULD	JSR	INCDT2		
2DCA:	EE	33	2F	487		INC	RNDMVIV	::INSTRCT	
2DCD:	AE	33	2F	488		LDX	RNDMVIV	::#57	
2DD0:	FE	06		489		CPX	#6		
2DD2:	D0	05		490		BNE	RRVIS1		
2DD4:	A2	00		491		LDX	#0		
2DD6:	8E	33	2F	492		STX	RNDMVIV		
2DD9:	BD	F9	2F	493	RRVIS1	LDA	LTRVIVULD,X		
2DDC:	91	02		494		STA	(R0WRKP),Y		
2DDE:	20	99	2E	495		JSR	INCDT		
2DE1:	60			496		RTS			
2DE2:	20	94	2E	497	RRZERO	JSR	INCDT2		
2DE5:	A9	00		498		LDA	#0	::INSTRCT	
2DE7:	91	02		499		STA	(R0WRKP),Y	::#58	
2DE9:	20	99	2E	500		JSR	INCDT		
2DEC:	60			501		RTS			
2DED:	E6	08		502	ADDBYTW	INC	CPWP	::INSTRCT	
2DEF:	B1	08		503		LDA	(CPWP),Y	::#60	
2DF1:	18			504		CLC			
2DF2:	65	04		505		ADC	RTWRKP		
2DF4:	AA			506		TAX			
2DF5:	AA			507		INC	CPWP		
2DF7:	B1	08		508		LDA	(CPWP),Y		
2DF9:	65	05		509		ADC	RTWRKP+1		
2DFB:	C9	00		510	DBCHK	CMP	##B0		
2DFD:	B0	0C		511		BCS	ADDBER		
2DFF:	C9	78		512		CMP	##78		
2E01:	90	08		513		BCC	ADDBER		
2E03:	85	05		514	ADDBDN	STA	RTWRKP+1		
2E05:	86	04		515		STX	RTWRKP		
2E07:	20	F0	2E	516		JSR	TDCALC		
2E0A:	60			517		RTS			
2E0B:	4C	B1	2E	518	ADDBER	JMP	HITBEND		
2E0E:	E6	08		519	SUBBYTW	INC	CPWP	::INSTRCT	
2E10:	A5	04		520		LDA	RTWRKP	::#61	
2E12:	38			521		SEC			
2E13:	F1	08		522		SBC	(CPWP),Y		
2E15:	AA			523		TAX			
2E16:	E6	08		524		INC	CPWP		
2E18:	A5	05		525		LDA	RTWRKP+1	::INSTRCT	
2E1A:	F1	08		526		SBC	(CPWP),Y	::#41	
2E1C:	4C	FB	2D	527		JMP	DBCHK		
2E1F:	E6	08		528	ADDBYT	INC	CPWP	::INSTRCT	
2E21:	B1	08		529		LDA	(CPWP),Y	::#62	
2E23:	18			530		CLC			
2E24:	65	00		531		ADC	RDP		
2E26:	85	00		532		STA	RDP		

2E28:	E6	08	541	INC	CPWP	
2E29:	B1	08	542	LDA	(CPWP),Y	
2E2A:	65	01	543	ADC	RDP+1	
2E2B:	00	01	544	STA	RDP+1	
2E2C:	20	D9	545	JSR	TRDPWRK	
2E2D:	60		546	RTS		
2E34:	E6	08	548	SUBBYT	INC	CPWP
2E35:	A5	00	549	LDA	RDP	: INSTRUCT
2E36:	00		550	SEC		: #63
2E37:	F1	08	551	SBC	(CPWP),Y	
2E38:	05	00	552	STA	RDP	
2E39:	00	08	553	INC	CPWP	
2E3A:	F6	08	554	LDA	RDP+1	
2E3B:	A5	01	555	SBC	(CPWP),Y	
2E3C:	F1	08	556	STA	RDP+1	
2E3D:	05	01	557	JSR	TRDPWRK	
2E3E:	20	D9	558	RTS		
2E49:	20	99	560	SWLDCD	JSR	INCDT
2E4C:	20	84	561	JSR	SETINCF	: INSTRUCT
2E4F:	60		562	RTS		: #70
2E50:	A9	00	564	MWLDCD	LDA	#0
2E51:	80	2B	565	STA	MPFLAG	: INSTRUCT
2E52:	20	99	566	JSR	INCDT	: #71
2E53:	60		567	RTS		
2E59:	20	94	568	STHIGH	JSR	INCDT2
2E5C:	B1	04	569	LDA	(RTWRKP),Y	: INSTRUCT
2E5E:	09	80	570	ORA	#80	: #73
2E60:	91	04	571	STA	(RTWRKP),Y	
2E62:	20	99	572	JSR	INCDT	
2E65:	60		573	RTS		
2E66:	4C	59	574	QUIT	JMP	\$FF59
			575			: INST#75
			576			
			577			
			578			
			579			
			580			
			581			
			582			
2E69:	A9	40	583	RSETUP	LDA	##40
2E6B:	85	01	584	STA	RDP+1	: SETUP
2E6D:	A9	00	585	LDA	#0	: THE
2E6F:	85	00	586	STA	RDP	: RAW
2E71:	80	2A	587	STA	IMODE	: DISK
2E74:	80	2B	588	STA	MPFLAG	: BYTE
2E77:	80	2D	589	STA	ENDBFLAG	: BUFFER
2E7A:	20	D9	590	JSR	TRDPWRK	
2E7D:	60		591	RTS		
2E7E:	A2	00	592	CLRMPLG	LDX	#0
2E80:	8E	2B	593	STX	MPFLAG	: CLEAR
2E83:	60		594	RTS		: MP
			595			: FLAG
2E84:	A2	80	596	SETINCF	LDX	##80
2E86:	D0	02	597	BNE	SIS1	: SET
2E88:	A2	01	598	SETINCN	LDX	##01
2E8A:	8E	2C	599	STX	MNBFLAG	: FORCE
2E8D:	60		600	SIS1	RTS	: NOFORCE
			601			: INC
2E8E:	AE	2C	602	INCDT3	LDX	MNBFLAG
2E91:	30	06	603	BMI	INCDT	: INC
2E93:	60		604	RTS		: DATA/
2E94:	AE	2C	605	INCDT2	LDX	MNBFLAG
2E97:	F0	0B	606	BEQ	IL1	: TIME
2E99:	A2	00	607	INCDT	LDX	#0
2E9B:	8E	2C	608	STX	MNBFLAG	: BUFFER
2E9D:	F0	04	609	INC	RTWRKP	: POINTER
2E9F:	F0	02	610	INC	RDWRKP	: IF
2EA2:	F0	01	611	BEQ	IS1	: MNB
2EA4:	60		612	IL1	RTS	: FLAG IS
2EA5:	EE	05	613	IS1	INC	: SET
2EA7:	A6	03	614	INC	RTWRKP+1	
2EA9:	A6	05	615	INC	RDWRKP+1	
2EAB:	E0	B0	616	LDX	RTWRKP+1	
2EAD:	D0	F5	617	CPX	##80	
2EAE:	68		618	BNE	IL1	
2EAF:	68		619	PLA		
2EB0:	68		620	PLA		
2EB1:	A2	01	621	HITBEND	LDX	#1
2EB3:	8E	2D	622	STX	ENDBFLAG	
2EB6:	A2	FF	623	LDX	##FF	
2EB8:	86	02	624	STX	RDWRKP	
2EB9:	86	04	625	STX	RTWRKP	
2EBB:	A2	77	626	LDX	##77	
2EBE:	86	03		STX	RDWRKP+1	

2EC0:	A2	AF	627		LDX	#\$AF	
2EC2:	86	05	628		STX	RTWRKP+1	
2EC4:	60		629		RTS		
2EC5:	AE	2B	630				
2EC8:	D0	0E	631	PATFSET	LDX	MPFLAG	PATRN
2ECA:	EE	2B	632		BNE	PATS1	FLAG
2ECD:	A6	02	633		INC	MPFLAG	SET &
2ECF:	86	00	634	TWRKRD	LDX	RDWRKP	TRANSFER
2ED1:	A6	03	635		STX	RDP	RDWRKP
2ED3:	86	01	636		LDX	RDWRKP+1	TO RDP
2ED5:	20	0B	637		STX	RDP+1	
2ED8:	60		638		JSR	TWRKCPP	
			639	PATS1	RTS		
2ED9:	48		640				
2EDA:	A9	00	641	TRDPWRK	PHA		INSTRCT
2EDC:	8D	2C	642		LDA	#0	#40
2EDF:	A5	00	643		STA	MNBFLAG	
2EE1:	85	02	644		LDA	RDP	TRANSFER
2EE3:	85	04	645		STA	RDWRKP	RDP TO
2EE5:	A5	01	646		STA	RTWRKP	DATA
2EE7:	85	03	647		LDA	RDP+1	WORK
2EE9:	18		648		STA	RDWRKP+1	AND
2EEA:	69	38	649		CLC		CALC
2EEC:	85	05	650		ADC	#\$38	TIME
2EEF:	68		651		STA	RTWRKP+1	WORK
			652		PLA		
			653		RTS		
2EF0:	A5	04	654				
2EF2:	85	02	655	TDCALC	LDA	RTWRKP	CALC
2EF4:	A5	05	656		STA	RDWRKP	DATA
2EF6:	38		657		LDA	RTWRKP+1	WORK
2EF7:	E9	38	658		SEC		FROM
2EF9:	85	03	659		SBC	#\$38	TIME
2EFB:	60		660		STA	RDWRKP+1	WORK
			661		RTS		
2EFC:	A6	06	662				
2EFE:	86	08	663	TCPWPWRK	LDX	CPP	TRANSFER
2F00:	86	07	664		STX	CPWP	CPP TO
2F02:	86	09	665		LDX	CPP+1	CNTRL
2F04:	60		666		STX	CPWP+1	WORK
			667		RTS		
2F05:	20	0B	668				
2F08:	E6	06	669	TWRKCPP1	JSR	TWRKCPP	POINT
2F0A:	60		670		INC	CPP	AFTER
2F0B:	A6	08	671		RTS		COMMAND
2F0D:	86	06	672	TWRKCPP	LDX	CPWP	TRANSFER
2F0F:	86	09	673		STX	CPP	CNTRL
2F11:	86	07	674		LDX	CPWP+1	WORK
2F13:	60		675		STX	CPP+1	TO CPP
			676		RTS		
2F14:	A6	00	677				
2F16:	8E	2E	678	TRDPSTR	LDX	RDP	INSTRCT
2F19:	A6	01	679		STX	STORAGEL	#42
2F1B:	8E	2F	680		LDX	RDP+1	TRANSFER
2F1E:	60		681		STX	STORAGEH	RDP TO
			682		RTS		STORAGE
2F1F:	AE	2E	683				
2F22:	86	00	684	TSTRD	LDX	STORAGEL	INSTRCT
2F24:	AE	2F	685		STX	RDP	#43
2F27:	86	01	686		LDX	STORAGEH	TRANSFER
2F29:	60		687		STX	RDP+1	STORAGE
			688		RTS		TO RDP
2F2A:	00		689				
2F2B:	00		690	IMODE	DFB	0	
2F2C:	00		691	MPFLAG	DFB	0	
2F2D:	00		692	MNBFLAG	DFB	0	
2F2E:	00		693	ENDBFLAG	DFB	0	
2F2F:	00		694	STORAGEL	DFB	0	
2F30:	00		695	STORAGEH	DFB	0	
2F31:	00		696	SUBPNTR	DFB	0	
2F32:	00		697	RNDMULD	DFB	0	
2F33:	00		698	RNDMINV	DFB	0	
			699	RNDMIV	DFB	0	
			700				
			701				
			702				
			703				
			704				
2F34:	10		705	LTCINST	DFB	\$10	ANLDONE
2F35:	20		706		DFB	\$20	STRTSUB
2F36:	21		707		DFB	\$21	RTRNSUB
2F37:	35		708		DFB	\$35	SIMODE
2F38:	36		709		DFB	\$36	SIMODE2
2F39:	30		710		DFB	\$30	CIMODE5
2F3A:	31		711		DFB	\$31	CIMODE
2F3B:	32		712		DFB	\$32	CIMODER

\*-----\*  
 \* LOOK UP TABLE FOR COMMANDS \*  
 \*-----\*

2F3C:	40	713	DFB	\$40	TRDPWRK
2F3D:	41	714	DFB	\$41	TWRKRD
2F3E:	42	715	DFB	\$42	TRDPSTR
2F3F:	43	716	DFB	\$43	TSTRRD
2F40:	44	717	DFB	\$44	FINVLD
2F41:	45	718	DFB	\$45	FNONFF
2F42:	46	719	DFB	\$46	RRVALID
2F43:	47	720	DFB	\$47	RRINVLD
2F44:	48	721	DFB	\$48	RRVIVLD
2F45:	49	722	DFB	\$49	RRZERO
2F46:	50	723	DFB	\$50	ADDBYTW
2F47:	51	724	DFB	\$51	SUBBYTW
2F48:	52	725	DFB	\$52	ADDBYT
2F49:	53	726	DFB	\$53	SUBBYT
2F4A:	54	727	DFB	\$54	SWLDCD
2F4B:	55	728	DFB	\$55	MWLDCD
2F4C:	56	729	DFB	\$56	STHIGH
2F4D:	57	730	DFB	\$57	QUIT

```

*-----*
* LOOK UP TABLE FOR COMMAND *
* ADDRESSES *
*-----*

```

2F4E:	00	2D	LTAINST	DA	ANLDONE	10	0
2F50:	1B	2D		DA	STRTSUB	20	1
2F52:	24	2D		DA	RTRNSUB	21	2
2F54:	38	2D		DA	SIMODE	25	3
2F56:	4A	2D		DA	SIMODE2	36	4
2F58:	55	2D		DA	CIMODES	30	5
2F5A:	34	2D		DA	CIMODE	31	6
2F5C:	46	2D		DA	CIMODER	32	7
2F5E:	D9	2E		DA	TRDPWRK	40	8
2F60:	CD	2E		DA	TWRKRD	41	9
2F62:	14	2F		DA	TRDPSTR	42	A
2F64:	1F	2F		DA	TSTRRD	43	B
2F66:	5B	2D		DA	FINVLD	50	C
2F68:	7B	2D		DA	FNONFF	51	D
2F6A:	91	2D		DA	RRVALID	55	E
2F6C:	AC	2D		DA	RRINVLD	56	F
2F6E:	C7	2D		DA	RRVIVLD	57	10
2F70:	E2	2D		DA	RRZERO	58	11
2F72:	ED	2D		DA	ADDBYTW	60	12
2F74:	0E	2E		DA	SUBBYTW	61	13
2F76:	1F	2E		DA	ADDBYT	62	14
2F78:	34	2E		DA	SUBBYT	63	15
2F7A:	49	2E		DA	SWLDCD	70	16
2F7C:	50	2E		DA	MWLDCD	71	17
2F7E:	59	2E		DA	STHIGH	73	18
2F80:	66	2E		DA	QUIT	75	19

```

*-----*
* LOOK UP TABLE OF INVALID DISK *
* BYTE PATTERNS *
*-----*

```

2F82: 07 0E 1C 768  
2F85: 38 70 E0 80 769 LTFINVLD HEX 070E1C3870E080

```

*-----*
* LOOK UP TABLE FOR REPLACING *
* WITH VALID BYTES *
*-----*

```

2F89:	96	97	9A	776	LTRVALID	HEX	96979A9B9D9E9FA6
2F8C:	9B	9D	9E	9F	A6		
2F91:	A7	AB	AC	AF	777	HEX	A7ABACADAEAFB2B3
2F94:	AD	AE	AF	B2	B3		
2F99:	B4	B5	B6	B7	B8	HEX	B4B5B6B7B8B9BABBBC
2F9C:	B7	B8	BA	BB	BC		
2FA1:	BD	BE	BF	779	HEX	BDBEBFCBCDCECFD3	
2FA4:	CB	CD	CE	CF	D3		
2FA9:	D6	D7	D9	780	HEX	D6D7D9DADBDCDDDE	
2FAC:	DA	DB	DC	DD	DE		
2FB1:	DF	E5	E6	781	HEX	DFE5E6E7E9EAEBEC	
2FB4:	E7	E9	EA	EB	EC		
2FB9:	ED	EE	EF	782	HEX	EDEEEFF2F3F4F5F6	
2FBC:	F2	FF	F3	F5	F6		
2FC1:	F7	FF	FC	783	HEX	F7F9FAFBFCFDFEFF	
2FC4:	FB	FD	FE	FF			
2FC9:	AA	D5	784	HEX	AAD5		

```

*-----*
* LOOK UP TABLE FOR REPLACING *
* WITH INVALID BYTES *
*-----*

```

```

790
2FCB: 80 81 82 791 LTRINVLD HEX 8081828384858687
2FCE: 83 84 85 86 87
2FD3: 88 89 8A 8B 8C
2FD6: 8D 8E 8F
2FDB: 90 91 92 93 94
2FDE: A0 A1 A2 A3 B0
2FF3: B1 B2 B3 B4 B5
2FF6: C1 C2 C3 C4 C5
2FF9: C6 C7 C8 C9 CA
2FFB: CB CC CD CE CF
2FFD: D0 D1 D2 D3 D4
2FF3: E2 E3 E4 E5 E6
2FF6: F0 F1 F2 F3 F4
796

```

```

797
798 *-----*
799 * LOOK UP TABLE FOR REPLACING *
800 * WITH VERY INVALID BYTES *
801 *-----*
802

```

```

2FF9: 80 81 82 803 LTRVIVLD HEX 80818283C0C1
2FFC: 83 C0 C1

```

--End assembly--

981 bytes

Errors: 0

30000	78	30
30002	00	32
30004	A0	32
30006	D0	22
30008	D4	33
3000A	68	33
3000C	1	88
3000E	FF	99
30010	BD	99
30012	%	33
30014	33	34
30016	43	34
30018	4C	44
3001A	90	44
3001C	56	44
3001E	7	44
30020	80	44
30022	9B	44
30024	55	4A
30026	5D	4A
30028	9	4A
3002A	76	4A
3002C	4A	CC
3002E	FF	CC
30030	88	CC
30032	FF	CC
30034	B0	CC
30036	5	CC
30038	7	CC
3003A	25	44
3003C	25	55
3003E	FF	55
30040	53	55
30042	8B	22
30044	67	55
30046	CC	55
30048	00	55
3004A	D3	55
3004C	D0	55
3004E	DD	55
30050	1A	40
30052	40	65
30054	65	29
30056	88	35
30058	B2	35
3005A	B0	35
3005C	DA	34
3005E	02	35
30060	F4	35
30062	BF	37
30064	DD	37
30066	7B	37
30068	B6	36
3006A	19	38
3006C	AC	38
3006E	CF	3D
30070	EF	3A
30072	42	3A
30074	33	3E
30076		

```

3078: A6 DD DD 79 TXT
3079: DD DD DD A0 A0 FD A0
3080: DD A0 A0 A0 A0 C5 A0
3081: C9 C1 CC C4 C1 CE D4
3093: A0 C4 C5 DD CC C9 C3 C1
3096: D4 CE DD B4 FB A0 D0
30A0: CC D5 D3 FD DD DD

```

```
*-----*
```

```
* EDD 4 TEXT *
```

```
*-----*
```

	ORG	\$3000
TXABLE	DA	TXT
	DA	TXTS
	DA	TXSLT
	DA	TXMNU
	DA	TXO
	DA	TXAD
	DA	TXADR
	DA	TXQ
	DA	TXCS
	DA	TXOD
	DA	TXI1
	DA	TXI0
	DA	TXID
	DA	TXIB
	DA	TXIBL
	DA	TXIOD
	DA	TXIDD
	DA	TXI2
	DA	TXDS1
	DA	TXDS2
	DA	TXRPM
	DA	TXED
	DA	TXEM1
	DA	TXEM2
	DA	TXD
	DA	TXLP
	DA	TXUO
	DA	TXRWD
	DA	TXSC
	DA	TXIB2
	DA	TXST
	DA	TXET
	DA	TXAT
	DA	TXTRK
	DA	TXTF
	DA	TXSY
	DA	TXY
	DA	TXN
	DA	TXA
	DA	TXM
	DA	TXCE
	DA	TXCEG
	DA	TXCEB
	DA	TXNC
	DA	TXCPYDSK
	DA	TXRTB
	DA	TXIBPR
	DA	TXIOPR
	DA	TXIOPR
	DA	TXCHPRM
	DA	TXWPARM
	DA	TXWPCNL
	DA	TXWCNTL
	DA	TXNOTE
	DA	TXRPARM
	DA	TXCPY1
	DA	TXCPY2
	DA	TXCPY3
	DA	PLSLOT
	DA	PCSER

[illegible]

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```

30A9: DD A0 A0 80 ASC " ) ) VERSION 4.2( PLUS)"
30AC: A0 FC A0 A0 FD A0 A0 A0 D2
30B4: A0 A0 A0 A0 D6 A0 A0 C5
30BC: D3 C9 CF CE A0 B4 AE B2
30C4: FB A0 D0 CC D5 D3 FD
30CB: DD A0 A0 81 ASC " ) SERIAL NUMBER #000000"
30CE: A0 A0 A0 A0 A0 A0 A0 D3
30D6: C5 D2 C9 C1 CC A0 CE D5
30DE: CD C2 C5 D2 A0 A3 B0 B0
30E6: B0 B0 B0 B0 82
30FA: DD A0 A0 82 ASC " ) APRIL 23, 1986 ]"
30FD: A0 A0 A0 A0 A0 A0 A0 A0
30F5: A0 A0 A0 C1 D0 D2 C9 CC
30FD: A0 B2 B3 AC A0 B1 B9 B8
3105: B6 A0 A0 A0 A0 A0 A0
310D: A0 A0 A0 D0 83
3111: DD A0 A0 83 ASC " ) UTILICO MICROWARE"
3114: A0 A0 A0 A0 A0 A0 A0 A0
311C: A0 D5 D4 C9 CC C9 C3 CF
3124: A0 CD C9 C3 D2 CF D7 C1
312C: D2 C5 84
312E: DD A0 A0 A0 B3 B3 B7 B7 ASC " ) 3377 SOLANO AVE., SUITE#352"
3133: A0 A0 A0 A0 CC C1 CE CF A0
3139: A0 D3 CF CC C1 CE CF D5
3141: C1 D4 C5 AE AC A0 D3
3149: C9 D4 C5 A3 B3 B5 B2
3150: DD A0 A0 85 ASC " ) NAPA, CALIFORNIA 94558]]"
3153: A0 A0 A0 A0 A0 A0 CE C1
315B: DD C1 AC A0 C3 C1 CC C9
3163: C6 CF D2 CE C9 C1 A0
316B: B9 B4 B5 B5 B8 D0 D0
3173: DD A0 A0 86 ASC " ) (SOFTWARE) BY DONALD A. SCHNAPP]"
3175: FC A0 A0 A0 FD A0 A0 A0
317D: FB D3 CF C6 D4 D7 C1 D2
3185: C5 FD A0 C2 D9 A0 C4 CF
318D: CE C1 CC C4 A0 C1 AE A0
3195: D3 C3 C8 CE C1 D0 D0 D0
319D: FB A0 A0 87 ASC " ( HARDWARE BY CHARLES J. ROSENBERG]]"
31A8: A0 A0 C8 C1 D2 C4 D7 C1
31B0: D2 C5 A0 C2 D9 A0 C3 C8
31B8: C1 D2 CC CE D3 A0 CA AE
31C0: A0 D2 CF D3 C5 CE C2 C5
31C4: DD A0 A0 88 ASC " ) COPYRIGHT (C) 1986 UTILICO MICROWARE"
31C7: C3 CF D9 D2 C9 C7 C8
31CF: D4 A0 A8 C3 A9 A0 B1 B9
31D7: B8 B6 A0 D5 D4 C9 CC C9
31DF: C3 CF A0 CD C9 C3 D2 CF
31E7: D7 C1 D2 C5 89
31EB: DD A0 A0 A0 A0 A0 C1 CC
31EE: A0 A0 A0 A0 A0 D2 C7 C8 D4
31F6: CC A0 D2 C9 C7 C8 D2 C5 D3
31FE: A0 C1 D2 C5 A0 D2 C5 D3
3206: C5 D2 D6 C5 C4 DE C0
320D: A6 A0 FC 90 TXTS ASC "& ! ) ESSENTIAL DATA DUPLICATOR 4( PLUS]?"
3210: A0 A0 FD A0 A0 A0 A0 C5
3218: D3 D3 C5 CE D4 C9 C1 CC
3220: A0 C4 C1 D4 C1 A0 C4 D5
3228: D0 CC C9 C3 C1 D4 CF D2
3230: A0 B4 FB A0 D0 CC D5 D3
3238: DD C0
323A: A0 A0 A0 91 TXTRK ASC " 0000000000111111111222222222233333"
323D: A0 B0 B0 B0 B0 B0 B0 B0
3245: B0 B0 B0 B0 B0 B0 B0 B0
324D: B1 B1 B1 B1 B1 B1 B1 B1
3255: B2 B2 B2 B2 B2 B2 B2 B2
325D: B3 B3 B3 B3 B3 B3 B3 B3
3262: D4 D2 C8 92 ASC "TRK:012345678901234567890123456789012345?"
3265: BA B0 B1 B2 B3 B4 B5 B6
326D: B7 B8 B9 B0 B1 B2 B3 B4
3275: B5 B6 B7 B8 B9 B0 B1 B2
327D: B3 B4 B5 B6 B7 B8 B9 B0
3285: B1 B2 B3 B4 B5 C0
328D: AE B0 B0 93 TXTF ASC ".00(]"
3290: A8 D0
3293: AE B2 B5 94 ASC ".25(]"
3295: A8 D0
3298: AE B5 B0 95 ASC ".50(]"
329A: A8 D0
329D: AE B7 B5 96 ASC ".75(]"
329D: A8 D0 C0
32A0: FC A0 A0 97
32A3: A0 FD A0 98 TXSLT ASC "! ) ORIGINAL:S=0,D=0 DUPLICATE:S=0,D=0( (0)
32AB: CE C1 CC BA D3 BD B0 AC
32B3: C4 BD B0 A0 A0 C4 D5 D0

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32BB: CC C9 C3 C1 D4 C5 BA D3
32C3: B0 B0 AC C4 B0 B0 FB A0
32CB: A8 B0 A9 FD C0
          99
32D0: A6 DD DD 100 TX00 ASC "&]] - OPTION MENU -]]"
32D3: A0 A0 A0 A0 A0 A0 A0 A0
32DB: A0 CF D0 D4 C9 CF CE A0
32DE: C0 C5 CE D5 A0 A0 A0 DD
32FE: DD DD DD DD DD DD DD DD
32FF: A0 A0 A0 101 ASC " 1. BACK UP A DISK]"
32FF: A0 A0 A0 B1 AE A0 C2 C1
32FF: C3 C8 A0 D5 D0 A0 C1 A0
32FF: C4 C9 D3 CB DD
3304: A0 A0 A0 102 ASC " 2. CHANGE PARAMETERS]"
3307: A0 A0 A0 B2 AE A0 C3 C8
3307: C1 CE C7 D0 D0 C1 D2
3307: C1 CD C5 D4 C5 D2 DD
3307: A0 A0 A0 103 ASC " 3. CHECK DRIVE SPEED]"
3322: A0 A0 A0 B3 AE A0 C3 C8
3322: C5 C3 CB A0 C4 D2 C9 D4
3322: C5 A0 D3 D0 C5 C5 C4 DD
3322: A0 A0 A0 104 ASC " 4. DISK SCAN]"
3322: A0 A0 A0 B4 AE A0 C4 C9
3322: D3 CB A0 D3 C3 C1 CE DD
3322: A0 A0 A0 105 ASC " 5. CERTIFY AND ERASE DISK]"
3322: D2 D4 C9 C6 D9 A0 C1 CE
3322: C4 A0 C5 D2 C1 D3 C5 A0
3322: A0 A0 A0 106 ASC " 6. CHANGE SLOTS AND DRIVES]"
3322: A0 A0 A0 B6 AE A0 C3 C8
3322: C1 CE C7 C5 A0 D3 CC CF
3322: D4 D3 A0 C1 CE C4 A0 C4
3322: D2 C9 D6 C5 D3 DD
3322: A0 A0 A0 107 ASC " 7. EXAMINE DISK DRIVE]"
3322: A0 A0 A0 B7 AE A0 C5 D8
3322: C1 CD C9 CE C5 A0 C4 C9
3322: D3 CB A0 C4 D2 C9 D6 C5
3322: A0 A0 A0 108 ASC " 8. CLEAR ERROR CODES]"
3322: A0 A0 A0 B8 AE A0 C3 CC
3322: C5 C1 D2 A0 C5 D2 D2 CF
3322: D2 A0 C3 CF C4 C5 D3 DD
3322: A0 A0 A0 109 ASC " 9. QUIT^2"
3322: A0 A0 A0 B9 AE A0 D1 D5
3322: C9 D4 DE C0
          110
33D4: DF A0 A0 111 TX0 ASC "_ PRESS <"
33D7: A0 A0 A0 D0 D2 C5 D3 D3
33D7: A0 BC 45 54 112 FLS "RETURN"
33D7: 52 52 4E 113 ASC "> TO SELECT #[2]"
33D7: BE A0 D4 C5 CC C5 C3 D4
33D7: CF A0 D3 C0
          114
33F6: E0 A0 A0 115 TX0D ASC "` <"
33F6: A0 A0 A0 BC
          116
33F6: 4F A0 A0 116 FLS "0"
33F6: BE D2 C9 117 ASC ">RIGINAL OR <"
33F6: C7 C9 CE C1 CC A0 CF D2
33F6: A0 BC
          118
33F6: 44 BE D5 D0 118 FLS "D"
33F6: CC C9 C3 C1 D4 C5 A0 C4
33F6: D2 C9 D6 C5 BF DD A0 A0
33F6: A0 A0 D0 D2 C5 D3 D3 A0
          119
33F6: 12 05 14 120 INV "RETURN"
33F6: 15 12 0E
33F6: BE A0 C3 121 ASC "> FOR 2"
33F6: CF D2 A0 C0
          122
3335: E0 A0 A0 123 TX11 ASC "` INSERT 2"
3335: A0 A0 A0 C9 CE D3 C5 D2
3340: D4 A0 C0
          124
3343: 4F 52 49 125 TX10 FLS "ORIGINAL"
3343: 47 49 4E 41 4C
3343: C0 126 ASC "2"
3343: 44 55 50 127 TX1D FLS "DUPLICATE"
3343: 4C 49 43 41 54 45
3343: C0 128 ASC "2"
3343: C1 A0 129 TX1BL ASC "A"
3343: 42 4C 41 130 FLS "BLANK"
3343: 4E 4B

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345D: C0 131 ASC "2"
345E: A0 C4 C9 132 TXIB2 ASC "DISK INTO THE] 2"
3461: D3 CB A0 C9 CE D4 CF A0
3469: D4 C8 C5 D0 A0 A0 A0 C0
3471: 0F 12 09 133 TXID0 INV "ORIGINAL"
3474: 07 09 0E 01 0C
3479: A0 C4 D2 134 ASC "DRIVE2"
347C: C9 D6 C5 C0
3480: 04 15 10 135 TXIDD INV "DUPLICATE"
3483: 0C 09 03 01 14 05
3489: A0 C4 D2 136 ASC "DRIVE2"
348C: C9 D6 C5 C0
3490: 42 4F 54 137 TXIB FLS "BOTH"
3493: 48
3494: A0 C4 C9 138 ASC "DISKS2"
3497: D3 CB D3 C0
349B: A0 C1 CE 139
349E: C4 A0 D0 D2 C5 D3 D3 A0 ASC "AND PRESS <"
34A6: BC
34A7: 12 05 14 141 INV "RETURN"
34AA: 15 12 0E
34AD: BE DB C0 142 ASC ">[2"
34B0: E0 A0 C9 143
34B3: CE D3 C5 D2 D4 A0 TXIBPR ASC "` INSERT "
34B9: 42 4F 54 145 FLS "BOTH"
34BC: 48
34BD: A0 C4 C9 146 ASC "DISKS, THEN PRESS <"
34C0: D3 CB D3 AC A0 D4 C8 C5
34C8: CE A0 D0 D2 C5 D3 D3 A0
34D0: BC
34D1: 12 05 14 147 INV "RETURN"
34D4: 15 12 0E
34D7: BE DB C0 148 ASC ">[2"
34DA: E0 A0 C9 149
34DD: CE D3 C5 D2 D4 A0 TXIDPR ASC "` INSERT "
34E3: 4F 52 49 151 FLS "ORIGINAL"
34E6: 47 49 4E 41 4C
34EB: A0 C4 C9 152 ASC "DISK; PRESS <"
34EE: D3 CB BB A0 D0 D2 C5 D3
34F6: D3 A0 BC
34F9: 12 05 14 153 INV "RETURN"
34FC: 15 12 0E
34FF: BE DB C0 154 ASC ">[2"
3502: DF A0 C9 155
3505: CE D3 C5 D2 D4 A0 TXIDPR ASC "_ INSERT "
3508: 44 55 50 157 FLS "DUPLICATE"
350E: 4C 49 43 41 54 45
3514: A0 C4 C9 158 ASC "DISK; PRESS <"
3517: D3 CB BB A0 D0 D2 C5 D3
351F: D3 A0 BC
3522: 12 05 14 159 INV "RETURN"
3525: 15 12 0E
3528: BE DB C0 160 ASC ">[2"
352B: A0 A0 A0 161
352E: A0 A0 A0 D3 D4 C1 D2 D4 TXST ASC "START TRACK: 2"
3537: A0 D4 D2 C1 C3 CB BA A0
353E: C0
353F: A0 A0 A0 163 TXET ASC "END TRACK: 2"
3542: A0 A0 A0 A0 A0 C5 CE C4
354A: A0 D4 D2 C1 C3 CB BA A0
3552: C0
3553: A0 A0 A0 164 TXAT ASC "STEP: 2"
3556: A0 A0 A0 A0 A0 A0 A0
355E: A0 A0 D3 D4 C5 D0 BA A0
3566: C0
3567: DD DD A0 165
356A: A0 A0 A0 D3 D9 CE C3 C8 TXSY ASC "] SYNCHRONIZE TRACKS? 2"
3572: D2 CF CE C9 DA C5 A0 D4
357A: D2 C1 C3 CB D3 BF A0 C0
3582: A0 A0 A0 167
3585: A0 A0 A0 A0 A0 A0 CE TXNC ASC "NIBBLE COUNT?"
358D: C9 C2 C2 CC C5 A0 C3 CF
3595: D5 CE D4 BF
3599: DD A0 A0 169 ASC "] <"
359C: A8
359D: 4E
359E: CF 170 FLS "N"
35A0: 41 AF 171 ASC "O/"
35A1: D5 D4 CF 172 FLS "A"
35A1: D5 D4 CF 173 ASC "UTOMATIC/"

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35A4: CD C1 D4 C9 C3 AF
35A5: 4D 174
35AB: C1 CE D5 175
35AE: C1 CC A9 C0 176
35B2: DD A0 A0 177 TXRTB ASC "J BIT COPY TRACKS? 2"
35B5: A0 A0 A0 A0 C2 C9 D4
35BD: A0 C3 CF D0 D9 A0 D4 D2
35C5: C1 C3 CB D3 BF A0 C0 178
35CC: D9 C5 D3 179 TXY ASC "YES?"
35CF: C0
35D0: CE CF C0 180 TXN ASC "NO?"
35D3: C1 D5 D4 181 TXA ASC "AUTOMATIC?"
35D6: CF CD C1 D4 C9 C3 C0
35DD: CD C1 CE 182 TXM ASC "MANUAL?"
35E0: D5 C1 CC C0 183
35E4: A6 DD DD 184 TXCHPRM ASC "&]] - CHANGE PARAMETERS -"
35E7: A0 A0 A0 A0 A0 A0 A0
35EF: A0 C3 C8 C1 CE C7 C5 A0
35F7: D0 C1 D2 C1 CD C5 D4 C5
35FF: D2 D3 A0 A0 A0
3604: DD DD A0 185
3607: A0 A0 A0 A0 B1 AE A0
360F: C3 C8 C1 CE C7 C5 A0 D0
3617: C1 D2 C1 CD C5 D4 C5 D2
361F: A0 D6 C1 CC D5 C5 D3
3626: DD A0 A0 186
3629: A0 A0 A0 A0 B2 AE A0 D2
3631: C5 D0 D2 CF C7 D2 C1 CD
3639: A0 D0 D2 C5 C1 CE C1 CC
3641: D9 DA C5 A0 D2 CF D5 D4
3649: C9 CE C5
364C: DD A0 A0 187
364F: A0 A0 A0 A0 B3 AE A0 D2
3657: C5 D0 D2 CF C7 D2 C1 CD
365F: A0 D0 D2 C5 D7 D2 C9 D4
3667: C5 A0 D2 CF D5 D4 C9 CE
366F: C5
3670: DD A0 A0 188
3673: A0 A0 A0 A0 B4 AE A0 D2
367B: C5 D3 C5 D4 A0 D0 C1 D2
3683: C1 CD C5 D4 C5 D2 D3 A0
3688: D4 CF A0 C4 C5 C6 C1 D5
3693: CC D4
3695: DD A0 A0 189
3698: A0 A0 A0 A0 B5 AE A0 D2
36A0: C5 D4 D5 D2 CE A0 D4 CF
36A8: A0 CF D0 D4 C9 CF CE A0
36B0: CD C5 CE D5 DE C0 190
36B6: DD A0 A0 191 TXNOTE ASC "J REFER TO YOUR EDD DOCUMENTATION AND"
36B9: A0 D2 C5 C6 C5 D2 A0 D4
36C1: CF A0 D9 CF D5 D2 A0 C5
36C9: C4 C4 A0 C4 CF C3 D5 CD
36D1: C5 CE D4 C1 D4 C9 CF CE
36D9: A0 C1 CE C4
36DD: DD A0 D0 192
36E0: D2 CF C7 D2 C1 CD A0 C9
36E8: CE C6 CF D2 C0 C1 D4 C9
36F0: CF CE A0 CC C9 D3 D4 D3
36F8: A0 C9 C6 A0 CE C5 C3 C5
3700: D3 D3 C1 D2 D9 AE
3706: DD A0 A0 193
3709: A0 A0 A0 A0 A0 A0 A0
3711: A0 D0 D2 C5 D3 D3 A0 BC
3719: D1 BE A0 D4 CF A0 D1 D5
3721: C9 D4 AE DD DD DD DD
3728: A0 A0 A0 194
372B: A0 A0 A0 A0 A0 A0 A0
3733: A0 A0 A0 A0 A0 A0 A0
3738: A0 A0 A0 A0 A0 AF A0
3743: A0 A0 A0 AF DD
3748: A0 A0 A0 195
374B: A0 A0 A0 A0 A0 A0 A0
3753: A0 A0 A0 A0 A0 A0 A0
3758: A0 A0 A0 A0 A0 AF A0
3763: A0 A0 AF DD
3767: A0 A0 A0 196
376A: A0 A0 A0 A0 A0 A0 A0
3772: C3 D5 D2 D2 C5 CE D4 A0
377A: CE D5 CD C2 C5 D2 A0 A0
3782: A0 AF DD
3785: A0 A0 A0 197
3788: A0 A0 A0 A0 A0 A0 A0

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3790: A0 A0 A0 A0 A0 A0 A0 A0
3798: A0 A0 A0 A0 A0 A0 A0 A0
37A0: AF DD
37A2: A0 A0 A0 198 ASC " CURRENT VALUE^2"
37A5: A0 A0 A0 A0 A0 A0 A0 A0
37AD: A0 A0 A0 C3 D5 D2 D2 C5
37B5: CE D4 A0 D6 C1 CC D5 C5
37BD: DE C0

37BF: A0 A0 A0 199
37C2: A0 A0 A0 200 TXWPARM ASC " CHANGE "
37CA: C7 C5 A0 C8 C1 CE
37CD: 10 01 12 201 INV "PARAMETER"
37D0: 01 0D 05 14 05 12
37D6: BA A0 A0 202 ASC ": =2"
37D9: A0 A0 BD C0

37DD: A0 C3 C8 203 TXWPCNL ASC " CHANGE "
37E0: C1 CE C7 C5 A0
37E5: 10 13 05 205 INV "PREANALYZE"
37E8: 01 0E 01 0C 19 1A 05
37EF: A0 C2 D9 206 ASC " BYTE: =2"
37F2: D4 C5 BA A0 A0 A0 A0 BD
37FA: C0

37FB: A0 A0 A0 207
37FE: C3 C8 C1 CE C7 C5 A0 TXWCNTL ASC " CHANGE "
3805: 10 12 05 209 INV "PREWRITE"
3808: 17 12 09 14 05
380D: A0 C2 D9 210 ASC " BYTE: =2"
3810: D4 C5 BA A0 A0 A0 A0 BD
3818: C0

3819: A0 A0 A0 211
381C: A0 BE BE BE A0 TXRPARM ASC " >>> PARAMETERS HAVE BEEN RESET <<<]"
3824: C1 CD C5 D4 A0 D0 C1 D2
382C: C8 C1 D6 C5 A0 C2 C5 C5
3834: CE A0 D2 C5 D3 C5 D4 A0
383C: BC BC BC DD
3840: A0 A0 A0 213 ASC " >>> TO THEIR DEFAULT VALUE <<<[2"
3843: A0 BE BE BE A0 A0 A0 D4
384B: CF A0 D4 C8 C5 C9 D2 A0
3853: C4 C5 C6 C1 D5 CC D4 A0
385B: D6 C1 CC D5 C5 A0 A0 A0
3863: BC BC BC DB C0

3868: A6 DD DD 214
386B: A0 A0 A0 215 TXAD ASC "&]] - FLOPPY DISK UTILITIES -"
3873: A0 A0 A0 A0 A0 A0 A0 A0
387B: C4 C6 CC CF D0 D0 D9 A0
3883: CC C9 D4 C9 C5 D5 D4 C9
388B: AD D3 A0
388C: DD DD A0 216 ASC "]] 1. DISK SCAN"
388F: A0 A0 A0 A0 A0 B1 AE A0
3897: C4 C9 D3 CB A0 D3 C3 C1
389F: CE

38A0: DD A0 A0 217 ASC "] 2. CERTIFY AND ERASE DISK"
38A3: A0 A0 A0 A0 B2 AE A0 C3
38AB: C5 D2 D4 C9 C6 D9 A0 C1
38B3: CE C4 A0 C5 D2 C1 D3 C5
38BB: A0 A0 C9 D3 CB
38C0: DD A0 A0 218 ASC "] 3. RETURN TO OPTION MENU^2"
38C3: A0 A0 A0 A0 B3 AE A0 D2
38CB: C5 D4 D5 D2 CE A0 D4 CF
38D3: A0 CF 00 D4 C9 CF CE A0
38DB: CD C5 CE D5 DE C0

38E1: A6 DD DD 219
38E4: A0 A0 A0 220 TXADR ASC "&]] - DISK DRIVE UTILITIES -]]"
38F4: A0 A0 A0 A0 A0 A0 A0 A0
38F4: C9 D6 C5 A0 D5 D4 C9 CC
38FC: C9 D4 C9 C5 D3 A0 A0 AD
3904: DD DD
3906: A0 A0 A0 221 ASC " 1. CHECK DRIVE SPEED]"
3909: A0 A0 A0 B1 AE A0 C3 C8
3911: C5 C3 CB A0 C4 D2 C9 D6
3919: C5 A0 D3 D0 C5 C5 C4 DD
3921: A0 A0 A0 222 ASC " 2. EXAMINE DRIVE]"
3924: A0 A0 A0 B2 AE A0 C5 D8
392C: C1 CD C9 CE C5 A0 C4 D2
3934: C9 D6 C5 DD
3938: A0 A0 A0 223 ASC " 3. RETURN TO OPTION MENU^2"
393B: A0 A0 A0 B3 AE A0 D2 C5
3943: D4 D5 D2 CE A0 D4 CF A0
394B: CF D0 D4 C9 CF CE A0 CD
3953: C5 CE D5 DE C0

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3B5D: A0 D3 D0 244 TXDS2 ASC " SPEED IS: 2"
3B60: C5 C5 C4 A0 C9 D3 BA A0
3B68: C0
3B69: A0 D2 D0 245 TXRPM ASC " RPM[2]"
3B6C: CD DB C0
3B6F: A0 CC CF 246 TXLP ASC " LOOPS2"
3B72: CF D0 D3 C0 247
3B76: A6 DD DD 248 TXED ASC "&]] - EXAMINE DISK DRIVE -]]]"
3B79: A0 A0 A0 A0 A0 A0 A0 A0
3B81: A0 C5 D8 C1 CD C9 CE C5
3B89: A0 C4 C9 D3 CB A0 C4 D2
3B91: C9 D6 C5 A0 A0 AD DD DD
3B99: DD
3B9A: A0 A0 D2 250 ASC " READ/WRITE TRACK ABILITY =]"
3B9D: C5 C1 C4 AF D7 D2 C9 D4
3BA5: C5 A0 D4 D2 C1 C3 CB A0
3BAD: C1 C2 C9 CC C9 D4 D9 A0
3BB5: BD DD
3BB7: A0 A0 A0 251 ASC " AVERAGE DRIVE SPEED =]"
3BB8: A0 A0 A0 A0 C1 D6 C5 D2
3BC2: C1 C7 C5 A0 C4 D2 C9 D4
3BCA: C5 A0 D3 D0 C5 C5 C4 A0
3BD2: BD DD
3BD4: A0 A0 A0 252 ASC " DRIVE SPEED FLUCTUATION =]"
3BD7: C4 D2 C9 D6 C5 A0 D3 D0
3BDF: C5 C5 C4 A0 C6 CC D5 C3
3BE7: D4 D5 C1 D4 C9 CF CE A0
3BEF: BD DD
3BF1: A0 A0 C8 253 ASC " HIGHEST TRACK ACCESSIBLE =]"
3BF4: C9 C7 C8 C5 D3 D4 A0 D4
3BFC: D2 C1 C3 CB A0 C1 C3 C3
3C04: C5 D3 D3 C9 C2 CC C5 A0
3C0C: BD DD
3C0E: A0 A0 D1 254 ASC " QUARTER TRACK BLEED OVER =]"
3C11: D5 C1 D2 D4 C5 D2 A0 D4
3C19: D2 C1 C3 CB A0 C2 CC C5
3C21: C5 C4 A0 CF D6 C5 D2 A0
3C29: BD DD
3C2B: A0 A0 A0 255 ASC " MINIMUM ARM PHASE TIME =]^2"
3C2E: A0 CD C9 CE C9 CD D5 CD
3C36: A0 C1 D2 CD A0 D0 C8 C1
3C3E: D3 C5 A0 D4 C9 CD C5 A0
3C46: BD DD DE C0
3C4A: E0 A0 A0 256 TXEM1 ASC " EXAMINING THE 2"
3C4D: A0 A0 A0 C5 D8 C1 CD C2
3C55: CE C9 CE C7 A0 D4 C8 C5
3C5D: A0 C0
3C5F: DF A0 A0 258 TXEM2 ASC " (THIS OPTION TAKES ABOUT 60 SECONDS)[2"
3C62: A8 D4 C8 C9 D3 A0 CF D0
3C6A: D4 C9 CF CE A0 D4 C1 CB
3C72: C5 D3 A0 C1 C2 CF D5 D4
3C7A: A0 B6 B0 A0 D3 C5 C3 CF
3C82: CE C4 D3 A9 DB C0
3C88: DF A0 A0 259 TXD ASC " _ PRESS <"
3C8B: D0 D2 C5 D3 D3 A0 BC
3C92: 52 45 54 261 FLS "RETURN"
3C95: 55 52 4E
3C98: BE AC A0 262 ASC ">, PROCESS IS "
3C9B: D0 D2 CF C3 C5 D3 D3 A0
3CA3: C9 D3 A0
3CA6: 06 09 0E 263 INV "FINISHED"
3CA9: 09 13 08 05 04
3CAE: DB C0 264 ASC "[2"
3CB0: A0 A0 A0 265 TXWD ASC " "
3CB3: A0
3CB4: 57 52 49 267 FLS "WRITE-PROTECT"
3CB7: 54 45 6D 50 52 4F 54 45
3CBF: 43 54
3CC1: A0 D4 C8 268 ASC " THE "
3CC4: C5 A0
3CC6: 4F 52 49 269 FLS "ORIGINAL"
3CC9: 47 49 4E 41 4C
3CCE: A0 C4 C9 270 ASC " DISK[2"
3CD1: D3 CB DB C0
3CD5: A0 271 TXRWD ASC " "
3CD6: 52 45 4D 272 FLS "REMOVE"
3CD9: 4F 56 45
3CDC: A0 D7 D2 274 ASC " WRITE-PROTECT FROM "
3CDF: C9 D4 C5 AD D0 D2 CF D4
3CE7: C5 C3 D4 A0 C6 D2 CF CD

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30CFF:	A0				FLS	"BLANK"
30CFD:	4C	41	275			
30CFB:	4E					
30CF9:	A0	C9	276		ASC	"DISK[2]"
30CF8:	D3	CB	C0			
			277			
30CFC:	A6	DD	DD	278	TXSC	ASC "&]] - DISK SCAN -^2"
30CFE:	A0	A0	A0	A0	A0	A0
30D07:	A0	A0	A0	A0	A0	C4 C9
30D0F:	D3	CB	A0	D3	C3	C1 CE A0
30D17:	A0	DE	C0			
			279			
30D1A:	A6	DD	DD	280	TXCE	ASC "&]] - CERTIFY AND ERASE DISK -^2"
30D1D:	A0	A0	A0	A0	A0	A0 AD
30D25:	A0	C3	C5	D2	D4	C9 C6 D9
30D2D:	A0	C1	CE	C4	A0	C5 D2 C1
30D35:	D3	C5	A0	C4	C9	D3 CB A0
30D3D:	A0	DE	C0			
			281			
30D40:	E0	A0	A0	282	TXCEG	ASC "` SELECTED TRACKS CERTIFIED O.K.[2]"
30D43:	A0	A0	D3	C5	CC	C5 C3 D4
30D48:	C5	C4	A0	D4	D2	C1 C3 CB
30D53:	D3	A0	C3	C5	D2	D4 C9 C6
30D58:	C9	C5	C4	A0	CF	AE CB AE
30D63:	DB	C0				
			283			
30D65:	E0	A0	A0	284	TXCEB	ASC "` BAD DISK; CERTIFY HAS "
30D68:	A0	A0	A0	C2	C1	C4 A0 C4
30D70:	C9	D3	CB	BB	A0	C3 C5 D2
30D78:	D4	C9	C6	D9	A0	C8 C1 D3
30D80:	A0					
30D81:	06	01	09	285		INV "FAILED"
30D84:	0C	05	04			
30D87:	DB	C0		286		ASC "[2]"
			287			
30D89:	A6	DD	DD	288	TXCPYDSK	ASC "&]] - BACK UP A DISK -^2"
30D8C:	A0	A0	A0	A0	A0	A0 A0 A0
30D94:	A0	A0	A0	A0	A0	A0 C2 C1
30D9C:	C3	CB	A0	D5	D0	A0 C1 A0
30DA4:	C4	C9	D3	CB	A0	AD DE C0
			289			
30DAC:	A6	DD	A0	290	TXCPY1	ASC "&] TRACK START: (RAW DISK BYTES)]2"
30DAF:	A0	D4	D2	C1	C3	CB A0 D3
30DB7:	D4	C1	D2	D4	BA	A0 A8 D2
30DBF:	C1	D7	A0	C4	C9	D3 CB A0
30DC7:	C2	D9	D4	C5	D3	A9 DD C0
30DCF:	DD	A0	A0	291	TXCPY2	ASC "] END TRACK: (RAW DISK BYTES)]2"
30DD2:	C5	CE	C4	A0	D4	D2 C1 C3
30DDA:	CB	BA	A0	A8	D2	C1 D7 A0
30DE2:	C4	C9	D3	CB	A0	C2 D9 D4
30DEA:	C5	D3	A9	DD	C0	
30DEF:	DD	A0	A0	292	TXCPY3	ASC "] TRACK: TRACK LENGTH:]"
30DF2:	A0	A0	A0	A0	D4	D2 C1 C3
30DF7:	CB	BA	A0	A0	A0	A0 A0 A0
30DFD:	A0	D4	D2	C1	C3	CB A0 CC
30E0A:	C5	CE	C7	D4	C8	BA DD
30E11:	A0	A0	A0	293		ASC " DIFFERENCE:[2]"
30E14:	A0	A0	A0	A0	A0	A0 A0 A0
30E17:	A0	A0	A0	A0	A0	A0 A0 A0
30E2C:	C5	CE	C3	C5	BA	DB C0
			294			
30E33:	A6	DD	DD	295	PCSER	ASC "&]]]"
30E36:	DD					
30E39:	50	4C	55	296		FLS "PLUS"
30E3A:	53					
30E3B:	A0			297		ASC " "
30E3C:	43	41	52	298		FLS "CARD"
30E3D:	44					
30E3E:	A0			299		ASC " "
30E41:	45	52	52	300		FLS "ERROR:"
30E44:	4F	52	7A			
30E47:	DD	DD	A0	301		ASC "] EITHER THE EDD PLUS CARD IS NOT]"
30E4A:	A0	C5	C9	D4	C8	C5 D2 A0
30E4D:	D4	C8	C5	A0	C5	C4 C4 A0
30E52:	D0	CC	D5	D3	A0	C3 C1 D2
30E5A:	C4	A0	C9	D3	A0	CE CF D4
30E6A:	DD					
30E6B:	A0	A0	CC	302		ASC " LOCATED IN SLOT# , OR THE PLUS CARD]"
30E6E:	CF	C3	C1	D4	C5	C4 A0 C9
30E76:	CE	A0	D3	CC	CF	D4 A3 A0
30E7E:	AC	A0	CF	D2	A0	D4 C8 C5
30E86:	A0	D0	CC	D5	D3	A0 C3 C1
30E8F:	D2	C4	DD			
30E91:	A0	A0	C9	303		ASC " IS NOT CONNECTED TO THE "
30E94:	D3	A0	CE	CF	D4	A0 C3 CF



304	CE	D4	C5	C4	A0	
305	D4	C8	C5	A0		INV "ORIGINAL"
306	01	0C				ASC " DISK]"
307	01	0C				ASC " DRIVE CONTROLLER LOCATED IN SLOT# .]"
308	C5	A0	C5	CE	CE	
309	C5	A0	C5	D2	A0	
310	C5	A0	C5	C4	A0	
311	C5	A0	C5	D4	A3	
312	C5	A0	C5	D4	A3	
313	C5	A0	C5	D4	A3	
314	C5	A0	C5	D4	A3	
315	C5	A0	C5	D4	A3	
316	C5	A0	C5	D4	A3	
317	C5	A0	C5	D4	A3	
318	C5	A0	C5	D4	A3	
319	C5	A0	C5	D4	A3	
320	C5	A0	C5	D4	A3	
321	C5	A0	C5	D4	A3	
322	C5	A0	C5	D4	A3	
323	C5	A0	C5	D4	A3	
324	C5	A0	C5	D4	A3	
325	C5	A0	C5	D4	A3	
326	C5	A0	C5	D4	A3	
327	C5	A0	C5	D4	A3	
328	C5	A0	C5	D4	A3	
329	C5	A0	C5	D4	A3	
330	C5	A0	C5	D4	A3	
331	C5	A0	C5	D4	A3	
332	C5	A0	C5	D4	A3	
333	C5	A0	C5	D4	A3	
334	C5	A0	C5	D4	A3	
335	C5	A0	C5	D4	A3	
336	C5	A0	C5	D4	A3	
337	C5	A0	C5	D4	A3	
338	C5	A0	C5	D4	A3	
339	C5	A0	C5	D4	A3	
340	C5	A0	C5	D4	A3	
341	C5	A0	C5	D4	A3	
342	C5	A0	C5	D4	A3	
343	C5	A0	C5	D4	A3	
344	C5	A0	C5	D4	A3	
345	C5	A0	C5	D4	A3	
346	C5	A0	C5	D4	A3	
347	C5	A0	C5	D4	A3	
348	C5	A0	C5	D4	A3	
349	C5	A0	C5	D4	A3	
350	C5	A0	C5	D4	A3	
351	C5	A0	C5	D4	A3	
352	C5	A0	C5	D4	A3	
353	C5	A0	C5	D4	A3	
354	C5	A0	C5	D4	A3	
355	C5	A0	C5	D4	A3	
356	C5	A0	C5	D4	A3	
357	C5	A0	C5	D4	A3	
358	C5	A0	C5	D4	A3	
359	C5	A0	C5	D4	A3	
360	C5	A0	C5	D4	A3	
361	C5	A0	C5	D4	A3	
362	C5	A0	C5	D4	A3	
363	C5	A0	C5	D4	A3	
364	C5	A0	C5	D4	A3	
365	C5	A0	C5	D4	A3	
366	C5	A0	C5	D4	A3	
367	C5	A0	C5	D4	A3	
368	C5	A0	C5	D4	A3	
369	C5	A0	C5	D4	A3	
370	C5	A0	C5	D4	A3	
371	C5	A0	C5	D4	A3	
372	C5	A0	C5	D4	A3	
373	C5	A0	C5	D4	A3	
374	C5	A0	C5	D4	A3	
375	C5	A0	C5	D4	A3	
376	C5	A0	C5	D4	A3	
377	C5	A0	C5	D4	A3	
378	C5	A0	C5	D4	A3	
379	C5	A0	C5	D4	A3	
380	C5	A0	C5	D4	A3	
381	C5	A0	C5	D4	A3	
382	C5	A0	C5	D4	A3	
383	C5	A0	C5	D4	A3	
384	C5	A0	C5	D4	A3	
385	C5	A0	C5	D4	A3	
386	C5	A0	C5	D4	A3	
387	C5	A0	C5	D4	A3	
388	C5	A0	C5	D4	A3	
389	C5	A0	C5	D4	A3	
390	C5	A0	C5	D4	A3	
391	C5	A0	C5	D4	A3	
392	C5	A0	C5	D4	A3	
393	C5	A0	C5	D4	A3	
394	C5	A0	C5	D4	A3	
395	C5	A0	C5	D4	A3	
396	C5	A0	C5	D4	A3	
397	C5	A0	C5	D4	A3	
398	C5	A0	C5	D4	A3	
399	C5	A0	C5	D4	A3	
400	C5	A0	C5	D4	A3	

--End assembly--

3952 bytes

Errors: 0

```

1 *****
2 * ESSENTIAL DATA DUPLICATOR
3 * VERSION 4.2 STANDARD/PLUS
4 * 6502 ASSEMBLY SOURCE CODE
5 * COPYRIGHT (C) 1986
6 * ALL RIGHTS RESERVED
7 * UTILICO MICROWARE
8 * DONALD ANTHONY SCHNAPP
9 * PRINTED APRIL 23, 1986
10 *****
11
12 *-----*
13 * PREANALYZE BUFFER *
14 * B000 - $B0FF *
15 *-----*
16
17 ORG $B000
18
19 PREANLZ HEX 01
20 HEX 1010101010101010
21
22 HEX 1010101010101010
23
24 HEX 1010101010101010
25
26 HEX 1010101010101010
27
28 HEX 1010101010101010
29
30 HEX 1010101010101010
31
32 HEX 1010101010101010
33
34 HEX 1010101010101010
35
36 * $80 = CHANGE INVALID TO FF'S
37 HEX 325036FF01211010
38
39 HEX 1010101010101010
40
41 * $90 = GENERIC BITSLIP PRCTCN 2
42 * USED ON SOME EPYX SFTWR
43 * SIMILAR TO GENERIC BIT
44 * -SLIP PRCTCN (BELOW)
45
46 HEX 31D5AAAD60F600E7
47
48 HEX E7E7610300350101
49
50 HEX 0100000200010200
51
52 HEX 0102000101002110
53
54 * $B0 = GENERIC BITSLIP PROTECTN
55 * USE BY LOCKSMITH 5.0
56 * (COMPUTER) ADVANCED IDEAS
57 * MINDSCAPE
58
59 HEX 31D5AAAD60F800E7
60
61 HEX E7E7350102000102
62
63 HEX 0001010000002110
64
65 * $C8 = LOCK-IT-UP PROTECTION:
66 HEX 31D5AA967070AAAA
67
68 HEX AFAA71D5AAAD6056

```

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108 * $B200 - $B2FF *
109 *-----*
110 LTS      DA      $800      LOOK UP
111      DA      $880      TABLE
112      DA      $900      FOR
113      DA      $980      VTAB
114      DA      $A00      SCREEN
115      DA      $A80      POSTION
116      DA      $B00
117      DA      $B80
118      DA      $828
119      DA      $8A8
120      DA      $928
121      DA      $9A8
122      DA      $A28
123      DA      $AA8
124      DA      $B28
125      DA      $BA8
126      DA      $850
127      DA      $8D0
128      DA      $950
129      DA      $9D0
130      DA      $A50
131      DA      $AD0
132      DA      $B50
133      DA      $BD0
134
135 *-----*
136 * LOOKUP TABLE FOR *
137 * DIVIDE ROUTINE *
138 *-----*
139 B230: 10 27 F8 0A LTC 00      DA      10000,1000,100,10,1
140 B233: 03 34 00 00 01 00
141      DFB      0
142      DFB      0
143      DFB      0
144      DFB      0
145
146 *-----*
147 * LOOK UP TABLE FOR *
148 * CHANGE SLOT OPTION *
149 *-----*
150 B23F: 80 00 00 LTP      DFB      $80,8      OS
151 B240: 80 00 00      DFB      $80,3      00
152 B242: 80 00 00      DFB      $80,8      DS
153 B244: 80 00 00      DFB      $80,3      00
154 B246: 80 00 00      DFB      $80,8      PLUSCRD
155
156 *-----*
157 * LOOK UP TABLES FOR *
158 * READ/WRITE ABILITY *
159 * (EXAMINE DRIVE OPTION) *
160 *-----*
161 B248: FF FF FE 161 LTEX      DFB      $FF,$FF,$FE,$EE
162 B24A: FF FF CC F8 162      DFB      $FC,$CC,$F8,$88
163 B24C: FF FF E0 C0 163      DFB      $F0,$E0,$C0,$80
164 B24E: 80 00 164      DFB      0
165
166 B255: 1C 19 05 166 LTEA      DFB      28,25,5,5 ;TOGTHR
167 B258: 05 05 05 167      DFB      10,5,5,5 ;EQUALS
168 B25C: 05 04 03 168      DFB      5,4,3,3 ;100%
169 B260: 03 169
170
171 *-----*
172 * LOOK UP TABLE FOR DRIVE *
173 * SPEED CALCULATE ROUTINE *
174 *-----*
175 B261: 5C 2C 1D 174 LTDV      DFB      $5C,$2C,$1D,$00
176 B264: 00 175
177 B265: B0 B2 B5 176 LTQ      DFB      $B0,$B2,$B5,$B7
178 B268: B7 177
178
179 *-----*
180 * THE REST OF THE VARIABLES *
181 * ARE USED FOR VALUE STORING *
182 * AND GENERAL WORKSPACE DURING *
183 * PROGRAM EXECUTION. *
184 *-----*
185 B269: 00 00 00 184 LTEM      DFB      0,0,0,0,0

```



```

B2C7: 00      269 TRKLL DFB 0
B2C8: 00      270 TRKLH DFB 0
B2C9: 00      271 ERRORCD DFB 0
B2CA: 00      272 EDDVRSN DFB 0
B2CB: 00      273 EDDSNL DFB 0
B2CC: 00      274 EDDSNM DFB 0
B2CD: 00      275 EDDSNH DFB 0
                276
                277 *-----*
                278 * PARAMETER BUFFER *
                279 * $B300 - $B3FF *
                280 *-----*
                281 SPAGE DS $B300-SPAGE
                282
                283 *-----*
                284 * PARMS $00-$08 = SYNCTBLE
                285 *
                286 * THESE 9 PARAMETERS MAKE UP THE
                287 * RAW DISK BYTE PATTERN WHICH
                288 * EDD USES FOR SEARCHING, TO
                289 * SYNCHRONIZE EACH TRACK.
                290 *
                291 * THIS PATTERN MUST BE FOUND ON
                292 * THE TRACK SPECIFIED BY THE
                293 * "TRKSYNC" PARAMETER, (PARM$1B)
                294 * WHICH HAS A DEFAULT VALUE OF
                295 * TRACK 0.
                296 *
                297 * USING THE VALUE "7F" IN THIS
                298 * TABLE, REPRESENTS A "WILDCARD"
                299 * AND WILL MATCH ANY DISK BYTE.
                300 *
                301 * THIS TABLE HAS BEEN PRESET TO
                302 * SYNCHRONIZE OFF OF SECTOR 0
                303 * OF TRACK 0.
                304 *-----*
B300: D5 AA 96 305 SYNCTBLE DFB $D5,$AA,$96,$7F
B303: 7F      306
B304: 7F AA AA      DFB $7F,$AA,$AA,$AA
B307: AA      DFB $AA
B308: AA
                307
                308 *-----*
                309 * PARM $09 = TIMEBITS
                310 *
                311 * THIS IS THE AMOUNT OF TIMING
                312 * BITS THAT A TIMING BYTE IS
                313 * GIVEN WHEN EDD READS THE TRACK
                314 * USING THE "NORMAL" MODE. SINCE
                315 * MANY DISKS USE TWO TIMING BITS
                316 * INSTEAD OF ONE, YOU MAY NEED
                317 * TO USE A VALUE OF "2" HERE, IF
                318 * THE COPY-PROTECTION IS
                319 * CHECKING TIMING BITS.
                320 *
                321 * WHEN USING EDD 4 PLUS'S BIT-
                322 * COPY MODE, THE ACTUAL AMOUNT
                323 * OF TIMING BITS FOUND ON THE
                324 * TRACK IS USED, AND THIS PARM
                325 * IS NOT USED.
                326 *-----*
B309: 01      327 TIMEBITS DFB $1
                328
                329 *-----*
                330 * PARM $0A = SPECIAL CONTROL
                331 *
                332 * THIS PARAMETER AFFECTS THE
                333 * AMOUNT OF BYTES WRITTEN FOR
                334 * EACH TRACK:
                335 *
                336 * $00 = WRITE THE AMOUNT OF
                337 * BYTES DISPLAYED FOR THE
                338 * TRACK LENGTH.
                339 *
                340 * $80 = WRITE A FULL TRACK OF
                341 * $1BFF BYTES WHEN POSSIBLE
                342 *-----*
B30A: 80      343 SPCLCNTL DFB $80
                344
                345 DFB $0 ;UNUSED
                346
                347 *-----*
                348 * PARM $0C-$0D = ABSLNGT
                349 *
                350 * IF THE TRACK LENGTH IS TO
                351 * BE AN ABSOLUTE FORCED LENGTH.
                352

```

```

353 * (SEE PARM $12), USE THESE TWO
354 * VALUES AS THE ABSOLUTE TRACK
355 * LENGTH.
356 -----
B30C: 72 357 ABSLNGTL DFB $72
B30D: 18 358 ABSLNGTH DFB $18
359
360 DFB $0 ;UNUSED
361 DFB $0 ;UNUSED
362
363 -----
364 * PARM $10 = MINLNGTH
365 *
366 * THIS VALUE REPRESENTS THE
367 * HIGH BYTE OF THE LOWEST TRACK
368 * LENGTH ACCEPTABLE.
369 -----
B310: 14 370 MINLNGTH DFB $14
371
372 -----
373 * PARM $11 = MAXLNGTH
374 *
375 * THIS VALUE REPRESENTS THE
376 * HIGH BYTE OF THE LARGEST
377 * TRACK LENGTH ACCEPTABLE.
378 -----
B311: 1C 379 MAXLNGTH DFB $1C
380
381 -----
382 * PARM $12 = PLNGCNTL
383 *
384 * WHICH TRACK LENGTH ROUTINE(S)
385 * TO USE AND ORDER OF ROUTINE IF
386 * AN ERROR OCCURS:
387 *
388 * BIT POSITION: 7654 3210
389 *
390 * ROUTINE: 3213 213X
391 *
392 * ROUTINES AVAILABLE:
393 *
394 * 1 = DATA PATTERN
395 * LOCATE TWO MATCHING DATA
396 * PATTERNS (SEE PARMS $80-
397 * $FF) THEN SUBTRACT THEIR
398 * DISTANCE TO OBTAIN TRACK
399 * LENGTH.
400 *
401 * 2 = UNIQUE DATA PATTERN
402 * LOCATE A UNIQUE DATA
403 * PATTERN, THEN SEARCH FOR A
404 * MATCHING PATTERN, THEN
405 * SUBTRACT THEIR DISTANCE
406 * TO OBTAIN TRACK LENGTH
407 * (USES NO ADDITIONAL PARMS)
408 *
409 * 3 = ABSOLUTE FORCED LENGTH
410 * THE VALUES FOUND AT PARMS
411 * $0C-$0D ARE USED FOR THE
412 * TRACK LENGTH. NO TRACK
413 * SEARCHING IS NECESSARY.
414 *
415 * EXAMPLES:
416 * 0111 0000 = ORDER: 2,1,3
417 * 1000 0000 = 3 ONLY
418 *
419 * EDD HAS BEEN PRESET TO USE THE
420 * "UNIQUE DATA PATTERN" ROUTINE
421 * $40 = 01000000 = ROUTINE#2
422 -----
B312: 40 423 PLNGCNTL DFB $40
424
425 -----
426 * PARM $13 = PENDCNTL
427 *
428 * WHICH TRACK END ROUTINE(S) TO
429 * USE AND ORDER OF ROUTINES IF
430 * AN ERROR OCCURS:
431 *
432 * BIT POSITION: 7654 3210
433 *
434 * ROUTINE: 3213 213X
435 *
436 * ROUTINES AVAILABLE:
437 *
438 * 1 = TIMING GAP
439 * POINT TO THE BYTE LOCATED
440 * JUST BEFORE THE 1ST BYTE

```

```

439 *      OF THE LARGST TIMING GAP.
440 *      2 = DATA PATTERN
441 *      USE THE TRKSRCH INSTRCTN
442 *      ROUTINE (PARAMETERS $80-
443 *      -$FF) FOR LOCATING THE
444 *      TRACK END.
445 *      3 = DATA GAP
446 *      POINT TO THE BYTE LOCATED
447 *      JUST BEFORE THE 1ST BYTE
448 *      OF THE LARGEST DATA GAP.
449 *
450 * EXAMPLES:
451 * 0010 1010 = ORDER 1,2,3
452 * 0100 0000 = 2 ONLY
453 *
454 * EDD HAS BEEN PRESET TO USE THE
455 * "TIMING GAP" ROUTINE:
456 * $20 = 00100000 = ROUTINE#1
457 *
B313: 20 458 PENDCNL DFB $20
459
B314: 00 460             DFB $0             ;UNUSED
B315: 00 461             DFB $0             ;UNUSED
B316: 00 462             DFB $0             ;UNUSED
463
464 *-----
465 * PARM $17 = PTGAPMIN
466 *
467 * WHEN FINDING THE TRACK END BY
468 * SEARCHING FOR THE LARGEST
469 * TIMING GAP (SEE PARM $13) THIS
470 * PARM CONTAINS THE MINIMUM
471 * AMOUNT OF BYTES THE GAP MUST
472 * CONTAIN. IF NOT, THE TIMING
473 * ROUTINE FAILS.
474 *
B317: 02 475 PTGAPMIN DFB $2
476
B318: 00 477             DFB $0             ;UNUSED
478
479 *-----
480 * PARM $19 = RERRORS
481 *
482 * THE MAXIMUM AMOUNT OF ATTEMPTS
483 * TO READ THE TRACK PROPERLY
484 * BEFORE A READ ERROR IS FORCED
485 *
B319: 03 486 RERRORS DFB $3
487
488 *-----
489 * PARM $1A = WERRORS
490 *
491 * THE MAXIMUM AMOUNT OF ATTEMPTS
492 * OF WRITING THE TRACK PROPERLY
493 * BEFORE A WRITE ERROR IS FORCED
494 *
B31A: 03 495 WERRORS DFB $3
496
497 *-----
498 * PARM $1B = TRKSYNC
499 *
500 * THIS IS THE TRACK TO SYNCHRONZ
501 * FROM WHEN USING THE SYNC TRACK
502 * MODE.
503 *
504 * THIS TRACK VALUE IS THE ACTUAL
505 * QUARTER TRACK TO USE, (IE, IF
506 * THE VALUE OF $04 IS USED, THIS
507 * REPRESENTS 4 QUARTER TRACKS, &
508 * TRACK #1 WILL BE THE "SYNC
509 * FROM TRACK".
510 *
B31B: 00 511 TRKSYNC DFB $0
512
513 *-----
514 * PARM $1C = MNBTEQLN
515 *
516 * WHEN LOCATING THE TRACK LENGTH
517 * - IF MORE THAN THIS AMOUNT OF
518 * BYTES DON'T MATCH UP, THE
519 * LENGTH IS CONSIDERED INVALID,
520 * WHICH A READ ERROR OCCURS.
521 *
B31C: 10 522 MNBTEQLN DFB $10
523
524 *-----

```



```

225 * PARM $80-$BF = TBLEND
226 *
227 * WHEN USING A RAW DISK BYTE
228 * PATTERN TO LOCATE THE TRACK'S
229 * END (PARM $13), THIS TABLE
230 * IS USED FOR THE RAW DISK BYTE
231 * PATTERNS.
232 *
233 * THIS TABLE IS USED IN THE SAME
234 * FASHION AS A PREANALYZE OR
235 * PREWRITE ROUTINE (AS DESCRIBED
236 * IN THE EDD OPERATING MANUAL)
237 * THE MAIN DIFFERENCE HERE,
238 * IS THIS ROUTINE IS DONE
239 * DURING THE ANALYZE ROUTINE
240 * AND THE INSTRUCTION "$73" SETS
241 * A "FLAG" FOR FINDING THE END
242 * TRACK.
243 *
244 * PARAMETER $80 POINTS TO THE
245 * FIRST POSITION OF THE TABLE,
246 * WHICH HAS A DEFAULT VALUE OF
247 * $81, MEANING THAT PARAMETER
248 * $81 IS THE FIRST INSTRUCTION
249 * BYTE FOLLOWED.
250 *
251 * THE PRESET ROUTINE STARTS AT
252 * PARM $81, AND IT FINDS THE
253 * TRACK END BY LOCATING A DATA
254 * FIELD, THEN POINTING TO THE
255 * BYTE LOCATED AFTER A DATA
256 * FIELD EPILOGUE.
257 *
258 * REFER TO THE "INSTRUCTION
259 * BYTES" SECTION OF THE EDD 4
260 * MANUAL FOR A COMPLETE DESCRIPTION
261 * (INCLUDING SOME EXAMPLES)
262 * OF INSTRUCTION BYTES.
263 *
264 *-----
265 TBLEND DS $B380-TBLEND
266 HEX 81D5AAAD71DEAA73
267
268 HEX 2110101010101010
269
270 HEX 1010101010101010
271
272 HEX 1010101010101010
273
274 HEX 1010101010101010
275
276 HEX 1010101010101010
277
278 HEX 1010101010101010
279
280 HEX 1010101010101010
281
282 HEX 1010101010101010
283
284 HEX 1010101010101010
285
286 HEX 1010101010101010
287
288 HEX 1010101010101010
289
290 HEX 1010101010101010
291
292 HEX 1010101010101010
293
294
295 *-----
296 * PARM $C0-$FF = TRKLENGTH
297 *
298 * WHEN USING A RAW DISK BYTE
299 * PATTERN TO LOCATE THE TRACK'S
300 * LENGTH (PARM $12), THIS TABLE
301 * IS USED FOR THE RAW DISK BYTE
302 * PATTERNS.
303 *
304 * THIS TABLE IS USED IN THE SAME
305 * FASHION AS THE TBLEND TABLE
306 * ABOVE.
307 *
308 * PARAMETER $C0 POINTS TO THE
309 * FIRST POSITION OF THE TABLE,
310 * WHICH HAS A DEFAULT VALUE OF
311 * $C1, MEANING THAT PARAMETER
312 * $C1 IS THE FIRST INSTRUCTION
313 * BYTE FOLLOWED.
314 *
315 * THE PRESET ROUTINE HERE,
316 * LOCATES THE ADDRESS FIELD
317 * OF SECTOR ZERO, THEN LOOKS
318 * FOR THE REPEAT, SUBTRACTS
319 * THE DISTANCE FROM THEIR
320 * POSITIONS TO CALCULATE TRACK
321 * LENGTH.
322 *
323 *-----
324 TBLLNGTH HEX C131D5AA96707070

```

```

B3C3: AA 96 70 70 70
B3C8: 70 AA AA 603
B3CB: 36 73 21 10 10
B3D0: 10 10 10 604
B3D3: 10 10 10 10 10
B3D8: 10 10 10 605
B3DB: 10 10 10 10 10
B3DE: 10 10 10 606
B3E3: 10 10 10 10 10
B3E8: 10 10 10 607
B3EB: 10 10 10 10 10
B3F0: 10 10 10 608
B3F3: 10 10 10 10 10
B3F8: 10 10 10 609
B3FB: 10 10 10 10 10

```

```

HEX 70AAAA3673211010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010
HEX 1010101010101010

```

--End assembly--

1024 bytes

Errors: 0



```

199 *****
200 * ESSENTIAL DATA DUPLICATOR
201 * VERSION 4.2 STANDARD/PLUS
202 * 6502 ASSEMBLY SOURCE CODE
203 * COPYRIGHT (C) 1986
204 * ALL RIGHTS RESERVED
205 * UTILICO MICROWARE
206 * DONALD ANTHONY SCHNAPP
207 * PRINTED APRIL 23, 1986
208 *****
209
210 *****
211 * DRIVE ROUTINES *
212 *****
213
214 *-----*
215 * JUMP TABLE *
216 *-----*
217
218 ORG   DRVR   ;B700
219
220 JMP   TDUMPW   ;B700
221 JMP   TDUMPP   ;B703
222 JMP   ARMV     ;B706
223 JMP   ARMV2    ;B709
224 JMP   SYNCTRK2 ;B70C
225 JMP   TRKV1    ;B70F
226 JMP   TRKV2    ;B712
227 JMP   TRKV3    ;B715
228 JMP   ARMSPD   ;B718
229 JMP   WRITETRK ;B71B
230 JMP   DCCDUMP  ;B71E
231 JMP   TDUMPV   ;B721
232 JMP   TRKDS    ;B724
233 JMP   PCRDCHK  ;B727
234
235 DCCDUMP LDA DCCSLOT ;DUMP A
236 ASL A ;TRACK
237 ASL A ;USING
238 ASL A ;THE EDD
239 ASL A ;PLUS
240 TAX ;CARD
241 LDA #$40
242 STA $1
243 LDY #0
244 STY $0
245 LOOP1 LDA $1
246 CMP #$7F
247 BEQ DNDUMP
248 CHKRDY LDA $C081,X
249 BPL CHKRDY
250 LDA $C080,X
251 STA ($0),Y
252 INY
253 BNE LOOP1
254 INC $1
255 BNE CHKRDY
256 DNDUMP LDA #$40
257 STA $5
258 STA $7
259 LDA #$AF
260 STA $9
261 LDY #0
262 STY $0
263 STY $4
264 STY $6
265 STY $8
266 LDA #$F8
267 STA $2
268 LOOP3 LDX #8
269 LDA ($4),Y
270 STA $1
271 LOOP2 INC $2
272 ASL $1
273 ROL $0
274 BMI STORE
275 LDA $2
276 CMP #2
277 BNE LOOP4
278 STORE LDA $0
279 STA ($6),Y
280 LDA $2
281 STA ($8),Y
282 STY $0
283 LDA #$F8
284 STA $2

```

B7E0	00				INC	\$6		
B7E1	00				INC	\$8		
B7E2	00				BNE	LOOP4		
B7E3	00				INC	\$7		
B7E4	00				DEC	\$9		
B7E5	00				LDA	\$5		
B7E6	00				CMP	\$9		
B7E7	00				BCC	DCL3		
B7E8	00				DEX			
B7E9	00				BNE	LOOP2		
B7EA	00				INC	\$4		
B7EB	00				BNE	LOOP3		
B7EC	00				INC	\$5		
B7ED	00				LDA	\$5		
B7EE	00				CMP	\$9		
B7EF	00				BCC	LOOP3		
B7F0	00				LDY	\$6		
B7F1	00				LDA	#0		
B7F2	00				STA	\$6		
B7F3	00				STA	\$8		
B7F4	00				JMP	DCL4		
B7F5	00				STA	(\$6),Y		
B7F6	00				STA	(\$8),Y		
B7F7	00				INY			
B7F8	00				BNE	DCL2		
B7F9	00				DEC	\$9		
B7FA	00				INC	\$7		
B7FB	00				LDX	\$7		
B7FC	00				CPX	##78		
B7FD	00				BNE	DCL2		
B7FE	00				LDA	##AF		
B7FF	00				STA	\$9		
B800	00				LDA	(\$6),Y		
B801	00				TAX			
B802	00				LDA	(\$8),Y		
B803	00				STA	(\$6),Y		
B804	00				TXA			
B805	00				STA	(\$8),Y		
B806	00				INY			
B807	00				BNE	DCL1		
B808	00				INC	\$7		
B809	00				DEC	\$9		
B80A	00				LDA	\$7		
B80B	00				CMP	\$9		
B80C	00				BCC	DCL1		
B80D	00				RTS			
B80E	00				LDA	#0		
B80F	00				STA	\$0		
B810	00				LDA	##40		
B811	00				STA	\$1		
B812	00				LDX	CSLT		
B813	00				LDA	\$C08C,X		
B814	00				BPL	TDVL		
B815	00				STA	(\$0),Y		
B816	00				INY			
B817	00				BNE	TDVL		
B818	00				INC	\$1		
B819	00				LDA	\$1		
B81A	00				CMP	##78		
B81B	00				BNE	TDVL		
B81C	00				RTS			
B81D	00				DS	\$B800-MODDUMP		
B81E	00				LDA	##40		
B81F	00				JSR	TDS1		
B820	00				LDA	##40		
B821	00				STA	\$1		
B822	00				LDA	##78		
B823	00				STA	\$3		
B824	00				LDA	#0		
B825	00				STA	\$0		
B826	00				STA	\$2		
B827	00				TAY			
B828	00				LDA	(\$0),Y		
B829	00				BPL	TCS1		
B82A	00				LDA	#0		
B82B	00				STA	(\$2),Y		
B82C	00				INY			
B82D	00				BNE	TCL1		
B82E	00				INC	\$1		
B82F	00				INC	\$3		
B830	00				LDA	\$3		
B831	00				CMP	##B0		
B832	00				BNE	TCL1		

TRACK  
DUMP  
FOR  
VERIFYING  
WRITTEN  
TRACK

DUMP  
WHOLE  
TRACK  
INTO  
MEMORY

;END

B829:	60		371	RTS		
B82A:	09 80		372	ORA	#\$80	
B82C:	91 00		373	STA	(#0),Y	
B82E:	A0 09 B3		374	LDA	TIMEBITS	
B831:	4C 1A B8		375	JMP	TCL2	
			376			
B834:	A9 60		377	TDUMPP	LDA #\$60	DUMP
B836:	85 01		378	TDS1	STA \$1	PART
B838:	A0 00		379		LDY #0	OF THE
B83A:	A4 00		380		STY #0	TRACK
B83C:	A9 7F		381		LDA #\$7F	INTO
B83E:	85 02		382		STA \$2	MEMORY
B840:	A6 10		383	TDUMP	LDX CSLT	
B842:	EA		384	TDR	NOP	
B843:	85 03		385		STA \$3	
B845:	EA		386		NOP	
B846:	EA		387	TDL1	NOP	
B847:	BD 8C C0		388		LDA \$C08C,X	TIME
B84A:	30 18		389		BMI TDS2	THE
B84C:	BD 8C C0		390	TDL2	LDA \$C08C,X	BYTE TO
B84F:	30 16		391		BMI TDS2	SEE IF
B851:	BD 8C C0		392		LDA \$C08C,X	THERE
B854:	30 18		393		BMI TDS3	IS AT
B856:	BD 8C C0		394		LDA \$C08C,X	LEAST
B859:	30 16		395		BMI TDS3	ONE
B85B:	BD 8C C0		396		LDA \$C08C,X	TIMING
B85E:	30 11		397		BMI TDS3	BIT
B860:	BD 8C C0		398		LDA \$C08C,X	ATTACHD
B863:	30 0C		399		BMI TDS3	
B865:	10 E5		400		BPL TDL2	
B867:	91 00		401	TDS2	STA (\$0),Y	
B869:	C8		402		INY	
B86A:	D0 D6		403		BNE TDR	
B86C:	E6 01		404		INC \$1	
B86E:	10 D6		405		BPL TDL1	
B870:	60		406		RTS	
B871:	25 02		407	TDS3	AND \$2	
B873:	91 00		408		STA (\$0),Y	
B875:	C8		409		INY	
B876:	D0 CE		410		BNE TDL1	
B878:	E6 01		411		INC \$1	
B87A:	10 D0		412		BPL TDL2	
B87C:	60		413		RTS	
			414			
B87D:	A0 00		415	ARMV	LDY #0	ARM
B87F:	F0 02		416		BEQ AMS1	MOVE
B881:	A0 01		417	ARMV2	LDY #1	ROUTINE
B883:	8C BD B2		418	AMS1	STY ARMAITR	
B886:	A4 12		419		LDY CTRK	THIS
B888:	C0 FF		420		CPY #\$FF	ROUTINE
B88A:	D0 07		421		BNE AM	HANDLES
B88C:	48		422		PHA	WHOLE,
B88D:	A9 00		423		LDA #0	HALF,
B88F:	20 93 B8		424		JSR AM	AND,
B892:	68		425		PLA	QUARTER
B893:	8D 32 BB		426	AM	STA WANTTRK	TRACKS
B896:	C5 12		427		CMP CTRK	
B898:	F0 59		428		BEQ ARMDONE1	
B89A:	29 FE		429		AND #\$FE	
B89C:	8D 33 BB		430		STA WANTHALF	
B89F:	A0 01		431		LDY #1	
B8A1:	8C 34 BB		432		STY PHSLST	
B8A4:	A5 12		433		LDA CTRK	
B8A6:	29 FE		434		AND #\$FE	
B8A8:	20 0F B9		435		JSR ARMD01	
B8AB:	A5 12		436	AML1	LDA CTRK	
B8AD:	C0 33 BB		437		CMP WANTHALF	
B8B0:	F0 13		438		BEQ ARMQTR	
B8B2:	BD 07		439		BCC AMS2	
B8B4:	E6 12		440		INC CTRK	MOVE
B8B6:	E6 12		441		INC CTRK	UP
B8B8:	4C BF B8		442		JMP AMS3	
B8BB:	C6 12		443	AMS2	DEC CTRK	MOVE
B8BD:	C6 12		444		DEC CTRK	DOWN
B8BF:	20 11 B9		445	AMS3	JSR ARMD0	
B8C2:	4C AB B8		446		JMP AML1	
B8C5:	AD 32 BB		447	ARMQTR	LDA WANTTRK	QUARTER
B8C8:	C5 12		448		CMP CTRK	TRACKING
B8CA:	F0 16		449		BEQ ARMDONE	MANAGER
B8CC:	85 12		450		STA CTRK	
B8CE:	29 07		451		AND #\$07	
B8D0:	05 10		452		ORA CSLT	
B8D2:	A8		453		TAY	
B8D3:	18		454		CLC	
B8D4:	69 02		455		ADC #2	
B8D6:	29 F7		456		AND #\$F7	

457	TAX		
458	LDA	\$C080,Y	
459	LDA	\$C080,X	
460	JSR	W1	
461	ARMDONE	JSR	W2
462	LDA	CSLT	
463	LDA	\$C080,X	
464	LDA	\$C082,X	
465	LDA	\$C084,X	
466	LDA	\$C086,X	
467	ARMDONE1	JSR	EPCALC
468	LDY	CTRK	
469	LDA	DRVCOUNT	
470	BEQ	PCS2	
471	LDA	DRVLETR	
472	CMP	#0	CURNT
473	BEQ	PCS1	TRK
474	STY	CTRKD	PLACE
475	RTS		
476	PCS2	STY	CTRKD
477	PCS1	STY	CTRKO
478	RTS		
479	ARMD01	STA	CTRK
480	ARMD0	LDA	CTRK
481		AND	#06
482		ORA	CSLT
483	TAX		
484	INX		
485	LDY	PHSLST	
486	STA	PHSLST	
487	LDA	\$C080,Y	
488	LDA	\$C080,X	
489	JSR	W1	
490	RTS		
491			
492	TRKDS	LDX	CSLT
493	TRKDSL1	LDY	#4
494	TRKDSL2	JSR	DSKBYTE
495		CMP	#\$FF
496		BNE	TRKDSL1
497		DEY	
498		BNE	TRKDSL2
499		STY	\$1
500	TRKDSL3	LDA	\$C08C,X
501		BPL	TRKDSL3
502		CMP	#\$FF
503		BNE	DRVSS1
504		INX	
505		BNE	TRKDSL3
506		INC	\$1
507	DRVSS1	BNE	TRKDSL3
508		STY	\$0
509		RTS	
510			
511	TRKV1	LDA	#\$10
512		STA	\$0
513		STA	\$1
514		STA	\$2
515		STA	\$3
516	TRKV1L1	LDX	CSLT
517		DEC	\$1
518		BEQ	TRKV1ER
519		LDY	#\$10
520	TRKV1L2	LDA	\$C08C,X
521		BPL	TRKV1L2
522		CMP	\$0
523		STA	\$0
524		BNE	TRKV1L1
525		DEY	
526		BNE	TRKV1L2
527	TRKV1L3	LDA	\$C08C,X
528		BPL	TRKV1L3
529		CMP	\$0
530		BNE	TRKV1ER
531		DEC	\$2
532		BNE	TRKV1L3
533		DEC	\$3
534		BNE	TRKV1L3
535		CLC	
536	TRKV1ER	RTS	
537		SEC	
538		RTS	
539			
540	TRKV2	LDY	#0
541		STY	\$1
542		LDA	#\$33

85	00	543	STA	\$0	FOR
86	10	544	LDX	CSLT	MISC.
87	04	545	DEY		TRACKING
88	00	546	BNE	TRKV2L2	ROUTINS
89	00	547	DEC	\$0	
90	00	548	BEQ	TRKV2ER	
91	00	549	LDA	\$C08C,X	
92	10	550	BPL	TRKV2L2	
93	00	551	TRKV2L3	CMF	
94	00	552	BNE	TRKV2L1	
95	00	553	JSR	DSKBYTE	
96	00	554	CMF	#\$96	
97	00	555	BNE	TRKV2L3	
98	00	556	LDY	#\$10	
99	00	557	JSR	DSKBYTE	
00	00	558	AND	#\$55	
01	00	559	ASLA		
02	00	560	STA	\$2	
03	00	561	JSR	DSKBYTE	
04	00	562	AND	#\$55	
05	00	563	ORA	\$2	
06	00	564	STA	CWRK	
07	00	565	JSR	DSKBYTE	
08	00	566	CMF	#\$FF	
09	00	567	BNE	TRKV2ER	
10	00	568	DEC	\$1	
11	00	569	BNE	TRKV2L4	
12	00	570	DEY		
13	00	571	BNE	TRKV2L4	
14	00	572	LDA	CWRK	
15	00	573	CLC		
16	00	574	RTS		
17	00	575	TRKV2ER	SEC	
18	00	576	RTS		
19	00	577			
20	00	578	DSKBYTE	LDA \$C08C,X	GET A
21	00	579	BPL	DSKBYTE	DISK
22	00	580	RTS		BYTE
23	00	581			
24	00	582	SYNCTRK2	PHA	SYNCTRK
25	00	583	LDY	SYNCF LG	
26	00	584	BEQ	SYS3	SYNCF LG
27	00	585	CPY	#2	0=NO
28	00	586	BEQ	SYS4	1=MAYBE
29	00	587	CMF	TRKSYNC	2=YES
30	00	588	BEQ	SYS3	
31	00	589	SYS4	LDA TRKSYNC	SYNC
32	00	590	JSR	ARMV	FROMTRK
33	00	591	PLA		
34	00	592	PHA		
35	00	593	JSR	EPCALC1	
36	00	594	LDA	#\$53	FLASH
37	00	595	JSR	EP OUT	"S"
38	00	596	LDX	CSLT	E/PCODE
39	00	597	LDY	#0	
40	00	598	SYL1	LDA \$C000	
41	00	599	BMI	SYS2	
42	00	600	SYL2	LDA \$C08C,X	
43	00	601	BPL	SYL2	
44	00	602	EOR	SYNCTBLE,Y	
45	00	603	BMI	SYS1	
46	00	604	BNE	SYL1	
47	00	605	SYS1	INY	
48	00	606	CPY	#\$9	
49	00	607	BNE	SYL2	
50	00	608	SYL3	PLA	
51	00	609	JSR	ARMV	
52	00	610	RTS		
53	00	611	SYL2	CMF	#\$9B
54	00	612	BEQ	DOESC	
55	00	613	BIT	\$C010	
56	00	614	JMP	SYL1	
57	00	615	DOESC	JMP	CHKESC
58	00	616			
59	00	617	ARMSPD	LDA #0	ARM
60	00	618	STA	ARMTFSL	SPEED
61	00	619	STA	ARMWOKL	FINDER
62	00	620	STA	ARMCVL	FOR
63	00	621	STA	ARMTFSH	EXAMINE
64	00	622	LDA	#9	DISK
65	00	623	STA	ARMWOKH	DRIVE
66	00	624	LDA	#1	OPTION
67	00	625	STA	ARMCVH	
68	00	626	JSR	TESTIT	
69	00	627	BCS	TOFAST	
70	00	628	LDA	ARMCVL	



BA3A	80	35	BB	629	STA	ARMWOKL	
BA3D	30			630	SEC		
BA3E	ED	37	BB	631	SBC	ARMTFSL	
BA41	85	00		632	STA	\$0	
BA43	20	BF	B2	633	LDA	ARMCVH	
BA46	80	36	BBB	634	STA	ARMWOKH	
BA49	ED	38	BB	635	SBC	ARMTFSH	
BA4C	85	01		636	STA	\$1	
BA4E	46	01		637	LSR	\$1	
BA50	46	00		638	ROR	\$0	
BA53	18			639	CLC		
BA55	00	00		640	LDA	\$0	
BA58	80	37	BB	641	ADC	ARMTFSL	
BA5B	80	BF	B2	642	STA	ARMCVL	
BA5D	20	01		643	LDA	\$1	
BA5F	80	38	BB	644	ADC	ARMTFSH	
BA60	80	BF	B2	645	STA	ARMCVH	
BA63	20	00		646	LDA	\$0	
BA65	05	01		647	ORA	\$1	
BA67	4C	4B		648	BEQ	ARMSPL2	
BA69	4C	BE	BA	649	JMP	ARMSPL1	
BA6C	80	BF	B2	650	LDA	ARMCVL	
BA6E	80	37	BBB	651	STA	ARMTFSL	
BA72	80	BF	B2	652	LDA	ARMCVH	
BA75	80	38	BBB	653	STA	ARMTFSH	
BA78	80	35	BB	654	LDA	ARMWOKL	
BA7B	38			655	SEC		
BA7C	ED	BE	B2	656	SBC	ARMCVL	
BA7F	85	00		657	STA	\$0	
BA81	20	36	BB	658	LDA	ARMWOKH	
BA84	ED	BF	B2	659	SBC	ARMCVH	
BA87	85	01		660	STA	\$1	
BA89	46	01		661	LSR	\$1	
BA8B	46	00		662	ROR	\$0	
BA8D	20	00		663	LDA	\$0	
BA8F	18			664	CLC		
BA90	80	BE	B2	665	ADC	ARMCVL	
BA93	80	BF	B2	666	STA	ARMCVL	
BA96	20	01		667	LDA	\$1	
BA98	80	BF	B2	668	ADC	ARMCVH	
BA9B	80	BF	B2	669	STA	ARMCVH	
BA9E	20	00		670	LDA	\$0	
BAA0	05	01		671	ORA	\$1	
BAA2	20	10		672	BEQ	ARMSPL2	
BAA4	AD	38	BB	673	LDA	ARMTFSH	
BAA7	CD	36	BB	674	CMP	ARMWOKH	
BAAA	90	86		675	BCC	ARMSPL1	
BAAC	AD	37	BB	676	LDA	ARMTFSL	
BAAE	CD	35	BB	677	CMP	ARMWOKL	
BAB0	90	86		678	BCC	JMPHELP	
BAB2	AD	36	B2	679	LDA	ARMCVL	
BAB7	AE	BF	B2	680	LDX	ARMCVH	
BABA	60			681	RTS		
BABB	A9	88		682			
BABD	20	81	BB	683	TESTIT	LDA	#\$88
BAC0	20	1C	BB	684	JSR	ARMV2	
BAC3	B0	08		685	JSR	TRKV3	
BAC5	A9	00		686	BCS	TEER	
BAC7	20	81	BB	687	LDA	#0	
BACA	20	1C	BB	688	JSR	ARMV2	
BACE	60			689	JSR	TRKV3	
BAD0	AD	84	B2	690	RTS		
BAD1	0A			691	LDA	DCCSLOT	
BAD2	0A			692	ASL	A	
BAD3	0A			693	ASL	A	
BAD4	0A			694	ASL	A	
BAD5	0A			695	ASL	A	
BAD6	AD	00		696	TAX		
BAD8	84	00		697	LDY	#0	
BADA	84	01		698	STY	#0	
BADC	C8			699	STY	\$1	
BAD0	F0	34		700	INY		
BADF	48			701	BEQ	PCERR	
BAE0	68			702	PHA		
BAE1	48			703	PLA		
BAE2	68			704	PHA		
BAE3	68			705	PLA		
BAE4	68			706	PLA		
BAE5	68			707	PLA		
BAE6	BD	81	C0	708	LDA	\$C081,X	
BAE8	10	F2		709	BPL	PC1	
BAEA	AD	00		710	LDY	#0	
BAEK	BD	81	C0	711	LDA	\$C081,X	
BAE1	10	22		712	BPL	PCERR	
BAE2	C8			713	INY		
BAE2	D0	F8		714	BNE	PC2	

TOFAST

ARMSPL1

JMPHELP

ARMSPL2

TESTIT

TEER  
PCRDCHK

PC1

PC2

:A=LOW  
:X=HIGH

:CHECK  
:NEW ARM  
:TEST  
:SPEED

BAF4:	A0	00	715	PC3	LDY	#0	
BAF6:	BD	80	716		LDA	\$C080,X	
BAF9:	C8		717	PC4	INY		
BAFA:	F0	17	718		BEQ	PCERR	
BAFC:	BD	81	719		LDA	\$C081,X	
BAFF:	10	F8	720		BPL	PC4	
BB01:	BD	80	721		LDA	\$C080,X	
BB04:	BD	81	722		LDA	\$C081,X	
BB07:	10	04	723		BPL	PC5	
BB09:	E6	01	724		INC	\$1	
BB0B:	F0	06	725		BEQ	PCERR	
BB0D:	E6	00	726	PC5	INC	\$0	
BB0F:	D0	E3	727		BNE	PC3	
BB11:	F0	04	728		BEQ	PC6	
BB13:	A9	FF	729	PCERR	LDA	#\$FF	
BB15:	85	01	730		STA	\$1	
BB17:	A5	01	731	PC6	LDA	\$1	
BB19:	C9	20	732		CMP	#\$20	
BB1B:	60		733		RTS		
BB1C:	20	81	734	TRKV3	JSR	TRKV2	TRACK
BB1F:	B0	06	735		BCS	TRKV3ER	VERIFY
BB21:	C5	12	736		CMP	CTRK	ROUTINE
BB23:	D0	02	737		BNE	TRKV3ER	FOR
BB25:	18		738		CLC		EXAMINE
BB26:	60		739		RTS		DRIVE'S
BB27:	A9	8C	740	TRKV3ER	LDA	#\$BC	ARM
BB29:	85	12	741		STA	CTRK	SPEED
BB2B:	A9	00	742		LDA	#0	TEST
BB2D:	20	7D	743		JSR	ARMV	
BB30:	36		744		SEC		
BB31:	60		745		RTS		
			746				
			747				
			748				
			749				
			750				
			751				
BB32:	00		752	WANTTRK	DFB	0	
BB33:	00		753	WANTHALF	DFB	0	
BB34:	00		754	PHSLST	DFB	0	
BB35:	00		755	ARMWOKL	DFB	0	;WORK OK
BB36:	00		756	ARMWOKH	DFB	0	
BB37:	00		757	ARMTFSL	DFB	0	;TOSMALL
BB38:	00		758	ARMTFSH	DFB	0	
			759				
			760				
			761	MODWRITE	DS	\$BB74-MODWRITE	
			762				
BB74:	0A		763	WRITETRK	ASLA		ACTUAL
BB75:	AA		764		TAX		WRITE
BB76:	BD	A4	765		LDA	LTWRITE,X	TRACK
BB77:	8D	A2	766		STA	WRTJMP+1	ROUTINE
BB78:	BD	A5	767		LDA	LTWRITE+1,X	
BB79:	8D	A3	768		STA	WRTJMP+2	
BB82:	A6	10	769		LDX	CSLT	
BB84:	BD	8D	770		LDA	\$C08D,X	
BB87:	BD	8E	771		LDA	\$C08E,X	
BB8A:	10	02	772		BPL	S1	
BB8C:	38		773		SEC		
BB8D:	60		774		RTS		
BB8E:	98		775	S1	TYA		
BB8F:	49	FF	776		EOR	#\$FF	
BB91:	A8		777		JAY		
BB92:	C8		778		INY		
BB93:	EA		779		NOP		
BB94:	EA		780		NOP		
BB95:	EA		781		NOP		
BB96:	EA		782		NOP		
BB97:	EA		783		NOP		
BB98:	A9	00	784		LDA	#0	
BB9A:	9D	8F	785		STA	\$C08F,X	
BB9D:	1D	8C	786		ORA	\$C08C,X	
BBA0:	EA		787		NOP		
BBA1:	4C	FF	788	WRTJMP	JMP	\$FFFF	
			789				
			790				
			791				
			792				
			793				
BBA4:	B4	BF	794	LTWRITE	DA	LAF	01
BBA6:	90	BF	795		DA	LAE	02
BBA8:	6C	BF	796		DA	LAD	03
BBA9:	48	BF	797		DA	LAC	04
BBAC:	24	BF	798		DA	LAB	05
BBAD:	00	BF	799		DA	LAA	06
BBB0:	D8	BE	800		DA	LA9	07

```
BC48: EA
BC49: B9 00 97
BC4C: AA
```

L97  
W97

NOP  
LDA \$9700,Y  
TAX

;\$7B00

BC4D:	F0	0C	887		BEQ	S97	
BC4F:	CA		888		DEX		
BC50:	F0	09	889		BEQ	S97	
BC52:	CA		890		DEX		
BC53:	F0	06	891		BEQ	S97	
BC55:	CA		892		DEX		
BC56:	F0	03	893		BEQ	S97	
BC58:	CA		894		DEX		
BC59:	A5	00	895		LDA	\$0	
BC5B:	A6	10	896	S97	LDX	CSLT	
BC60:	B9	00	897		LDA	\$7B00,Y	
BC62:	9D	8D	898		STA	\$C08D,X	
BC63:	1D	8C	899		ORA	\$C08C,X	
BC66:	C8		900		INY		
BC67:	D0	DF	901		BNE	L97	
BC69:	4C	6D	902		JMP	W98	
			903				
BC6C:	EA		904	L98	NOP		
BC6D:	B9	00	905	W98	LDA	\$9800,Y	;\$7C00
BC70:	AA		906		TAX		
BC71:	F0	0C	907		BEQ	S98	
BC73:	CA		908		DEX		
BC74:	F0	09	909		BEQ	S98	
BC76:	CA		910		DEX		
BC77:	F0	06	911		BEQ	S98	
BC79:	CA		912		DEX		
BC7A:	F0	03	913		BEQ	S98	
BC7C:	CA		914		DEX		
BC7D:	A5	00	915		LDA	\$0	
BC7F:	A6	10	916	S98	LDX	CSLT	
BC81:	B9	00	917		LDA	\$7C00,Y	
BC84:	9D	8D	918		STA	\$C08D,X	
BC87:	1D	8C	919		ORA	\$C08C,X	
BC8A:	C8		920		INY		
BC8B:	D0	DF	921		BNE	L98	
BC8D:	4C	91	922		JMP	W99	
			923				
BC90:	EA		924	L99	NOP		
BC91:	B9	00	925	W99	LDA	\$9900,Y	;\$7D00
BC94:	AA		926		TAX		
BC95:	F0	0C	927		BEQ	S99	
BC97:	CA		928		DEX		
BC98:	F0	09	929		BEQ	S99	
BC9A:	CA		930		DEX		
BC9B:	F0	06	931		BEQ	S99	
BC9D:	CA		932		DEX		
BC9E:	F0	03	933		BEQ	S99	
BCA0:	CA		934		DEX		
BCA1:	A5	00	935		LDA	\$0	
BCA3:	A6	10	936	S99	LDX	CSLT	
BCA5:	B9	00	937		LDA	\$7D00,Y	
BCA8:	9D	8D	938		STA	\$C08D,X	
BCAB:	1D	8C	939		ORA	\$C08C,X	
BCAF:	C8		940		INY		
BCAF:	D0	DF	941		BNE	L99	
BCB1:	4C	B5	942		JMP	W9A	
			943				
BCB4:	EA		944	L9A	NOP		
BCB5:	B9	00	945	W9A	LDA	\$9A00,Y	;\$7E00
BCB8:	AA		946		TAX		
BCB9:	F0	0C	947		BEQ	S9A	
BCBB:	CA		948		DEX		
BCBC:	F0	09	949		BEQ	S9A	
BCBE:	CA		950		DEX		
BCBF:	F0	06	951		BEQ	S9A	
BCC1:	CA		952		DEX		
BCC2:	F0	03	953		BEQ	S9A	
BCC4:	CA		954		DEX		
BCC5:	A5	00	955		LDA	\$0	
BCC7:	A6	10	956	S9A	LDX	CSLT	
BCC9:	B9	00	957		LDA	\$7E00,Y	
BCCC:	9D	8D	958		STA	\$C08D,X	
BCCF:	1D	8C	959		ORA	\$C08C,X	
BCD2:	C8		960		INY		
BCD3:	D0	DF	961		BNE	L9A	
BCD5:	4C	D9	962		JMP	W9B	
			963				
BCD8:	EA		964	L9B	NOP		
BCD9:	B9	00	965	W9B	LDA	\$9B00,Y	;\$7F00
BCDC:	AA		966		TAX		
BCDD:	F0	0C	967		BEQ	S9B	
BCDF:	CA		968		DEX		
BCE0:	F0	09	969		BEQ	S9B	
BCE2:	CA		970		DEX		
BCE3:	F0	06	971		BEQ	S9B	
BCE5:	CA		972		DEX		

```

BCFE6: F0 03 973
BCFE7: CA 974
BCFE8: A5 00 975
BCFE9: A6 10 976 S9B
BCFE0: B9 00 7F 977
BCFE1: 9D 8D C0 978
BCFE2: 1D 8C C0 979
BCFE3: C8 980
BCFE4: 00 DF 981
BCFE5: 4C 05 BD 982
BCFE6: 983
BCFE7: 984
BCFE8: 985
BCFE9: 986
BCFE0: 987 L9C
BCFE1: 988 W9C
BCFE2: 989
BCFE3: 990
BCFE4: F0 0C 991
BCFE5: F0 09 992
BCFE6: CA 993
BCFE7: F0 06 994
BCFE8: CA 995
BCFE9: A5 00 996
BCFE0: A6 10 997 S9C
BCFE1: B9 00 80 998
BCFE2: 9D 8D C0 999
BCFE3: 1D 8C C0 1000
BCFE4: C8 1001
BCFE5: 00 DF 1002
BCFE6: 4C 29 BD 1003
BCFE7: 1004
BCFE8: 1005
BCFE9: 1006 L9D
BCFE0: 1007 W9D
BCFE1: 1008
BCFE2: 1009
BCFE3: 1010
BCFE4: F0 0C 1011
BCFE5: CA 1012
BCFE6: F0 09 1013
BCFE7: CA 1014
BCFE8: F0 06 1015
BCFE9: CA 1016
BCFE0: F0 03 1017
BCFE1: CA 1018
BCFE2: A5 00 1019 S9D
BCFE3: A6 10 1020
BCFE4: B9 00 81 1021
BCFE5: 9D 8D C0 1022
BCFE6: 1D 8C C0 1023
BCFE7: C8 1024
BCFE8: 00 DF 1025
BCFE9: 4C 4D BD 1026
BCFE0: 1027 L9E
BCFE1: 1028 W9E
BCFE2: 1029
BCFE3: 1030
BCFE4: F0 0C 1031
BCFE5: CA 1032
BCFE6: F0 09 1033
BCFE7: CA 1034
BCFE8: F0 06 1035
BCFE9: CA 1036
BCFE0: F0 03 1037
BCFE1: CA 1038 S9E
BCFE2: A5 00 1039
BCFE3: A6 10 1040
BCFE4: B9 00 82 1041
BCFE5: 9D 8D C0 1042
BCFE6: 1D 8C C0 1043
BCFE7: C8 1044
BCFE8: 00 DF 1045
BCFE9: 4C 71 BD 1046
BCFE0: 1047 L9F
BCFE1: 1048 W9F
BCFE2: 1049
BCFE3: 1050
BCFE4: F0 0C 1051
BCFE5: CA 1052
BCFE6: F0 09 1053
BCFE7: CA 1054
BCFE8: F0 06 1055
BCFE9: CA 1056
BCFE0: F0 03 1057
BCFE1: A5 00

```

```

BEQ S9B
DEX
LDA $0
LDX CSLT
LDA $7F00,Y
STA $C08D,X
ORA $C08C,X
INY
BNE L9B
JMP W9C
DFB 0,0,0,0,0,0,0,0
NOP
LDA $9C00,Y ;$8000
TAX
BEQ S9C
DEX
BEQ S9C
DEX
BEQ S9C
DEX
BEQ S9C
DEX
LDA $0
LDX CSLT
LDA $8000,Y
STA $C08D,X
ORA $C08C,X
INY
BNE L9C
JMP W9D
NOP
LDA $9D00,Y ;$8100
TAX
BEQ S9D
DEX
BEQ S9D
DEX
BEQ S9D
DEX
BEQ S9D
DEX
LDA $0
LDX CSLT
LDA $8100,Y
STA $C08D,X
ORA $C08C,X
INY
BNE L9D
JMP W9E
NOP
LDA $9E00,Y ;$8200
TAX
BEQ S9E
DEX
BEQ S9E
DEX
BEQ S9E
DEX
BEQ S9E
DEX
LDA $0
LDX CSLT
LDA $8200,Y
STA $C08D,X
ORA $C08C,X
INY
BNE L9E
JMP W9F
NOP
LDA $9F00,Y ;$8300
TAX
BEQ S9F
DEX
BEQ S9F
DEX
BEQ S9F
DEX
BEQ S9F
DEX
LDA $0

```

S9F

LAD  
WAD

SAO

LA 1  
WA 1

SA 1

LAZ  
WAZ

SAZ

LA3  
WA3

SAE

; \$8400

; \$8500

; \$8600

; \$8700

BE21:	4C	25	BE	144	JMP	WA4	
BE22:	EA			145	NOP		
BE23:	B9	00	A4	146	LDA	\$A400,Y	;\$8800
BE24:	AA			147	TAX		
BE25:	F0	0C		148	BEQ	SA4	
BE26:	CA			149	DEX	SA4	
BE27:	F0	09		150	BEQ	SA4	
BE28:	CA			151	DEX	SA4	
BE29:	F0	06		152	BEQ	SA4	
BE30:	CA			153	DEX	SA4	
BE31:	F0	03		154	BEQ	SA4	
BE32:	CA			155	DEX	SA4	
BE33:	A5	00		156	LDA	\$0	
BE34:	A6	10		157	LDX	CSLT	
BE35:	B9	00	88	158	LDA	\$8800,Y	
BE36:	90	80	C0	159	STA	\$C080,X	
BE37:	1D	8C	C0	160	ORA	\$C08C,X	
BE38:	C8			161	INY		
BE39:	D0	DF		162	BNE	LA4	
BE40:	4C	49	BE	163	JMP	WA5	
BE41:				164			
BE42:				165			
BE43:				166			
BE44:				167			
BE45:				168			
BE46:				169			
BE47:				170			
BE48:	EA			171	NOP		
BE49:	B9	00	A5	172	LDA	\$A500,Y	;\$8900
BE50:	AA			173	TAX		
BE51:	F0	0C		174	BEQ	SA5	
BE52:	CA			175	DEX	SA5	
BE53:	F0	09		176	BEQ	SA5	
BE54:	CA			177	DEX	SA5	
BE55:	F0	06		178	BEQ	SA5	
BE56:	CA			179	DEX	SA5	
BE57:	F0	03		180	BEQ	SA5	
BE58:	CA			181	DEX	SA5	
BE59:	A5	00		182	LDA	\$0	
BE60:	A6	10		183	LDX	CSLT	
BE61:	B9	00	89	184	LDA	\$8900,Y	
BE62:	90	80	C0	185	STA	\$C080,X	
BE63:	1D	8C	C0	186	ORA	\$C08C,X	
BE64:	C8			187	INY		
BE65:	D0	DF		188	BNE	LA5	
BE66:	4C	6D	BE	189	JMP	WA6	
BE67:				190			
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00000000	00	00	00	1266	DFB	0,0,0,0
00000000	00	00	00	1267		
00000000	EA	00	AA	1268	NOP	
00000000	EA	00	AA	1269	LDA	\$AA00,Y ;\$8E00
00000000	EA	00	AA	1270	TAX	
00000000	EA	00	AA	1271	BEQ	SAA
00000000	EA	00	AA	1272	DEX	SAA
00000000	EA	00	AA	1273	BEQ	SAA
00000000	EA	00	AA	1274	DEX	SAA
00000000	EA	00	AA	1275	BEQ	SAA
00000000	EA	00	AA	1276	DEX	SAA
00000000	EA	00	AA	1277	BEQ	SAA
00000000	EA	00	AA	1278	DEX	SAA
00000000	EA	00	AA	1279	LDA	\$0
00000000	EA	00	AA	1280	LDA	\$8E00,Y
00000000	EA	00	AA	1281	LDA	\$8E00,Y
00000000	EA	00	AA	1282	STA	\$C080,X
00000000	EA	00	AA	1283	ORA	\$C08C,X
00000000	EA	00	AA	1284	INX	
00000000	EA	00	AA	1285	BNE	LAA
00000000	EA	00	AA	1286	JMP	WAB
00000000	EA	00	AA	1287		
00000000	EA	00	AB	1288	NOP	
00000000	EA	00	AB	1289	LDA	\$AB00,Y ;\$8F00
00000000	EA	00	AB	1290	TAX	
00000000	EA	00	AB	1291	BEQ	SAB
00000000	EA	00	AB	1292	DEX	SAB
00000000	EA	00	AB	1293	BEQ	SAB
00000000	EA	00	AB	1294	DEX	SAB
00000000	EA	00	AB	1295	BEQ	SAB
00000000	EA	00	AB	1296	DEX	SAB
00000000	EA	00	AB	1297	BEQ	SAB
00000000	EA	00	AB	1298	DEX	SAB
00000000	EA	00	AB	1299	LDA	\$0
00000000	EA	00	AB	1300	LDA	\$8F00,Y
00000000	EA	00	AB	1301	LDA	\$8F00,Y
00000000	EA	00	AB	1302	STA	\$C080,X
00000000	EA	00	AB	1303	ORA	\$C08C,X
00000000	EA	00	AB	1304	INX	
00000000	EA	00	AB	1305	BNE	LAB
00000000	EA	00	AB	1306	JMP	WAC
00000000	EA	00	AB	1307		
00000000	EA	00	AC	1308	NOP	
00000000	EA	00	AC	1309	LDA	\$AC00,Y ;\$9000
00000000	EA	00	AC	1310	TAX	
00000000	EA	00	AC	1311	BEQ	SAC
00000000	EA	00	AC	1312	DEX	SAC
00000000	EA	00	AC	1313	BEQ	SAC
00000000	EA	00	AC	1314	DEX	



BF53:	F0	06	1315		BEQ	SAC		
BF55:	CA		1316		DEX			
BF56:	F0	03	1317		BEQ	SAC		
BF58:	CA		1318		DEX			
BF59:	A5	00	1319		LDA	\$0		
BF5B:	A6	10	1320	SAC	LDX	CSLT		
BF5D:	B9	00	1321		LDA	\$9000,Y		
BF60:	9D	8D	1322		STA	\$C08D,X		
BF63:	1D	8C	1323		ORA	\$C08C,X		
BF66:	C8		1324		INY			
BF67:	D0	DF	1325		BNE	LAC		
BF69:	4C	6D	1326	BF	JMP	WAD		
BF6C:	EA		1327					
BF6D:	B9	00	1328	LAD	NOP			
BF70:	AA		1329	WAD	LDA	\$AD00,Y		;\$9100
BF71:	F0	0C	1330		TAX			
BF73:	CA		1331		BEQ	SAD		
BF74:	F0	09	1332		DEX			
BF76:	CA		1333		BEQ	SAD		
BF77:	F0	06	1334		DEX			
BF79:	CA		1335		BEQ	SAD		
BF7A:	F0	03	1336		DEX			
BF7C:	CA		1337		BEQ	SAD		
BF7D:	A5	00	1338		DEX			
BF7F:	A6	10	1339	SAD	LDA	\$0		
BF81:	B9	00	1340		LDX	CSLT		
BF84:	9D	8D	1341		LDA	\$9100,Y		
BF87:	1D	8C	1342		STA	\$C08D,X		
BF8A:	C8		1343		ORA	\$C08C,X		
BF8B:	D0	DF	1344		INY			
BF8D:	4C	91	1345	BF	BNE	LAD		
			1346		JMP	WAE		
BF90:	EA		1347					
BF91:	B9	00	1348	LAE	NOP			
BF94:	AA		1349	WAE	LDA	\$AE00,Y		;\$9200
BF95:	F0	0C	1350		TAX			
BF97:	CA		1351		BEQ	SAE		
BF98:	F0	09	1352		DEX			
BF9A:	CA		1353		BEQ	SAE		
BF9B:	F0	06	1354		DEX			
BF9D:	CA		1355		BEQ	SAE		
BF9E:	F0	03	1356		DEX			
BF9F:	CA		1357		BEQ	SAE		
BF9A1:	A5	00	1358		DEX			
BF9A3:	A6	10	1359	SAE	LDA	\$0		
BF9A5:	B9	00	1360		LDX	CSLT		
BF9A8:	9D	8D	1361		LDA	\$9200,Y		
BF9AB:	1D	8C	1362		STA	\$C08D,X		
BF9AF:	C8		1363		ORA	\$C08C,X		
BF9B1:	D0	DF	1364		INY			
	4C	B5	1365	BF	BNE	LAE		
			1366		JMP	WAF		
BF9B4:	EA		1367					
BF9B5:	B9	00	1368	LAF	NOP			
BF9B8:	AA		1369	WAF	LDA	\$AF00,Y		;\$9300
BF9B9:	F0	0C	1370		TAX			
BF9BB:	CA		1371		BEQ	SAF		
BF9BC:	F0	09	1372		DEX			
BF9BE:	CA		1373		BEQ	SAF		
BF9C1:	F0	06	1374		DEX			
BF9C2:	CA		1375		BEQ	SAF		
BF9C4:	F0	03	1376		DEX			
BF9C5:	CA		1377		BEQ	SAF		
BF9C7:	A5	00	1378		DEX			
BF9C9:	A6	10	1379	SAF	LDA	\$0		
BF9C9:	B9	00	1380		LDX	CSLT		
BF9CC:	9D	8D	1381		LDA	\$9300,Y		
BF9CF:	1D	8C	1382		STA	\$C08D,X		
BF9D2:	C8		1383		ORA	\$C08C,X		
BF9D3:	D0	DF	1384		INY			
BF9D5:	48		1385		BNE	LAF		
BF9D6:	68		1386		PHA			WRITE
BF9D7:	48		1387		PLA			DONE
BF9D8:	68		1388		PHA			
BF9D9:	18		1389		PLA			
BF9DA:	9D	00	1390		CLC			
BF9DC:	9D	8E	1391	SD1	BCC	SD1		
BF9DE:	1D	8C	1392		STA	\$C08E,X		
BF9E2:	18		1393		ORA	\$C08C,X		
BF9E3:	60		1394		CLC			
			1395		RTS			

--End assembly--

2276 bytes

Errors: 0

